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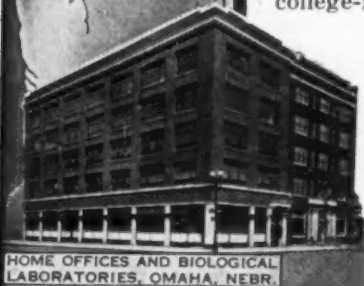
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**Nations Resort to High Veterinary Medical
Standards as a Public Trust**

The paramount motive for protesting against the development of low standards of veterinary medicine in farm management is based upon the historical fact that unprofitable farming and the uncertainties of human subsistence have not existed where high veterinary medical standards have been maintained by public sanction, or where practice by college-made veterinarians was successfully encouraged to the exclusion of practice methods not sanctioned in the approved professional codes.

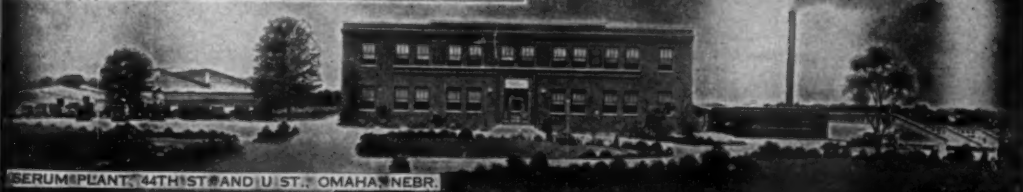
In the Corn States' theater of operation, where man's debt to farm animals and their products is calculated, there has been no worthy substitute for high veterinary medical standards.



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A Comparison of Oil of Chenopodium, Phenothiazine, and Sodium Fluoride as Anthelmintics for Swine

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OIL OF CHENOPODIUM (American wormseed oil) has been widely used for the removal of ascarids from swine since it was first employed for this purpose by Hall and Foster⁹ nearly thirty years ago. Users of the drug recognized its toxic properties, its limited and variable efficacy, and the difficulties of administering it. They also knew that the active constituent of the drug, ascaridol, occurred in variable amounts in commercial preparations, and that this factor was responsible for variations in both ascaricidal action and toxicity. There was, however, no comparably useful alternative treatment. With the introduction of phenothiazine by Harwood and his associates,¹¹ only a few years ago, there were indications that this new drug might prove to be a more satisfactory general anthelmintic for these animals. There were early reports of supposedly comparable efficacy against ascarids, repeated demonstrations of marked action on nodular worms, and plausible commendations of the ease with which phenothiazine could be administered. Moreover, the rapid success achieved by this drug as an anthelmintic for nearly all other classes of livestock undoubtedly gave encouragement to the hope that it would be a superior anthelmintic for swine. As experience with phenothiazine accumulated, however, it became disappointingly evident that this drug was not as well tolerated by growing pigs as at

first supposed, and that its efficacy against large roundworms was doubtfully equal to that of oil of chenopodium.

For the past half decade or less, the choice of drugs for the treatment of ascariasis in swine has been between oil of chenopodium and phenothiazine. Both drugs have been widely used, and individual preferences have frequently developed for one or the other of them. In spite of the specific advantages of each of these drugs, it has been generally apparent for some time that neither possesses to a high degree the requisites of a suitable general anthelmintic for swine. Because of the urgent need for a more satisfactory drug, and in consequence of the testing of many substances, the present writers recently reported⁸ on sodium fluoride as a substance meriting consideration for anthelmintic use in swine. The chemical was well tolerated in the therapeutic doses employed, and demonstrated ascaricidal action superior to that attained by either oil of chenopodium or phenothiazine.

The present report reviews the literature pertaining to the use of the drugs in question as anthelmintics for swine, including therein the hitherto unpublished results of tests which the writers have made from time to time with phenothiazine and oil of chenopodium, and presents limited data of an experiment on the comparative anthelmintic action of all three substances. In the light of these presentations and with due regard for the indefinite status of sodium fluoride, the specific advantages and

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disadvantages of each of these drugs are described in an attempt to arrive at a comparative evaluation of them.

REVIEW OF LITERATURE

Oil of Chenopodium.—The first report on the usefulness of oil of chenopodium as an anthelmintic for swine was published by Hall and Foster,⁹ of the U. S. Bureau of Animal Industry, in July, 1918, although it was noted in the *Report of the Chief of the Bureau of Animal Industry*, 1917,¹⁰ that the studies were in progress. In critical tests, doses of 1 to 2 cc. removed all of 11 ascarids from 3 pigs weighing 18 to 22 lb. each. As determined by fecal examination seven to ten days after treatment, doses of 0.8 to 1.0 cc. were adjudged to be completely effective against ascarids in 5 pigs weighing 27 to 62 lb. each.

In 1924, Mote¹¹ reported that doses of 4 to 5 cc. removed 78.0 per cent (7) of 9 ascarids from 4 pigs weighing 50 lb. each. A dose of 4 cc. was wholly ineffective, however, against 11 ascarids in 1 pig weighing 116 lb.

In November, 1925, Young¹² reported 16 deaths in a group of 62 pigs treated with recommended doses of the drug. Many worms were expelled after treatment, and very few worms were eliminated after a subsequent treatment with santonin ten days later. One death occurred in another group of 47 pigs treated in the same manner. In the latter trial, approximately equal numbers of worms were said to have been eliminated after each treatment.

In 1930, a veterinary practitioner¹³ reported anaphylactic shock in a herd of 100 pigs that was given an anthelmintic containing oil of chenopodium in a castor oil base. After 15 pigs had been treated, several were in convulsions, lying on their sides, and racing their legs. The other pigs were not treated until a few hours later when the affected pigs were apparently normal. Similar reactions occurred in the other pigs but there were no fatalities. The same anthelmintic had been used on another herd, apparently without untoward reactions. The writer postulated that rough handling of the ears, which were severely sunburned and swollen, coincident with treatment, may have been a contributing factor.

Morris and Martin¹⁴ in April, 1931, reported that a dose of 1.5 cc. removed 50.0 per cent (3) of 6 ascarids from 13 pigs averaging 15 lb. each. Nausea was observed in 6 pigs within two hours. Inflammation of the stomach and small intestine was found at necropsy seven days after treatment.

In tests reported in June, 1931, by LeBlanc,¹⁵ ascarid egg counts were somewhat reduced with a dose rate of 1 cc. per 50 lb. of body weight,

and considerable reductions were achieved with a dose rate of 1.5 cc. per 50 lb.

"A. T. K."¹⁶ in 1936, reported severe reactions in a group of 85 pigs weighing about 50 lb. each. Approximately 1 cc. was given in half an ounce of bland oil; four hours later several pigs were violently ill and 5 died. At necropsy an inflammatory fluid was found in the peritoneal cavity and there was an intense gastroenteritis.

In four tests reported by Swanson, Harwood, and Connelly,¹⁷ in March 1940, doses of 0.36 to 1.75 cc. removed 66.0 per cent (23) of 35 ascarids from 3 pigs weighing from 8 to 60 lb. each.

It was stated in the *Report of the Chief of the Bureau of Animal Industry*, 1942,¹⁸ that recommended doses of the drug removed 55.0 per cent (12) of 22 ascarids from 6 pigs.

In unpublished tests conducted at the Zoological Division, USBAI, doses of 2 to 3 cc. removed 78.0 per cent (40) of 51 ascarids from 9 pigs weighing from 28 to 75 lb. each. One pig died on the fifth day after treatment.

In critical tests, therefore, doses of 0.36 to 5.0 cc. of oil of chenopodium removed, in the aggregate, only 66.0 per cent (96) of 145 ascarids from 39 pigs weighing from 8 to 116 lb. each. Moreover, there are reports of at least 23 deaths, and other accounts of toxic reactions following treatment with therapeutic doses of the substance.

Phenothiazine.—In 1938, Harwood, Jerstad, and Swanson,¹¹ of the U. S. Bureau of Animal Industry, published the first report on the usefulness of phenothiazine as an anthelmintic for swine. At various dose rates and by various methods of administration, the drug attained efficacies of 0 to 100 per cent for ascarids and 25.0 to 100 per cent for nodular worms in 5 pigs. One gram per kilogram of body weight achieved complete elimination of both ascarids and nodular worms from 1 pig. This dosage, tested on 2 additional pigs, removed 94.0 per cent of the ascarids and 98.0 per cent of the nodular worms. The drug exhibited no significant anthelmintic action against stomach worms, horn-headed worms, hookworms, or whipworms. Toxic reactions were red-stained urine and, in some of the pigs, constipation.

In the *Report of the Chief of the Bureau of Animal Industry*, 1938¹⁹ which was issued about two weeks after the appearance of the above article, it was stated that dosages of 1 Gm. per kilogram of body weight, given in capsules to 2 pigs, removed all of the ascarids and nodular worms, but that smaller dosages were less effective.

A year later, Harwood, Habermann, and Swanson²⁰ reported the removal of 5.0 per cent of 44 immature ascarids, 62.0 per cent of 345 mature ascarids, and 92.0 per cent of 5,162 nodular worms from 22 pigs with dosages of from 0.5 to 1.0 Gm. per pound of body weight.

In these tests, as in those previously discussed, the phenothiazine used for treatment was a conditioned product especially prepared for use as an insecticide. Further tests with a relatively pure recrystallized product, in dosages of only 0.1 to 0.25 Gm. per pound of body weight, showed that the unconditioned chemical was more satisfactory as an anthelmintic. In these tests 19.0 per cent of 251 immature ascarids, 59.0 per cent of 197 mature ascarids, and 92.0 per cent of 625 nodular worms were removed in 16 trials.

In the *Report of the Chief of the Bureau of Animal Industry*, 1939,²¹ it was stated that commercial phenothiazine, at a dose rate of 0.5 Gm. per pound of body weight, removed 79.0 per cent of the ascarids and 96.0 per cent of the nodular worms from 11 pigs. The recrystallized product, at a dose rate of 0.1 Gm. per pound, removed 42.0 per cent of the ascarids and 94.0 per cent of the nodular worms from 10 pigs.

Swanson and Kates,²¹ in January, 1940, gave 270 Gm. of phenothiazine, presumably a conditioned product, in the feed to a litter of 9 pigs whose aggregate weight was 540 lb. The pigs were suffering from coccidiosis, against which the treatment had little, if any, effect. During the first two days after treatment, however, 6 ascarids and 29 nodular worms were eliminated by the pigs; necropsies were not performed.

In March, 1940, Swanson, Harwood, and Connelly²⁰ reported that conditioned phenothiazine, at dose rates of approximately 0.25 to 0.9 Gm. per pound of body weight, removed 4.5 per cent (2) of 44 immature ascarids, 61.9 per cent (215) of 347 mature ascarids, and 92.1 per cent (4,753) of 5,162 nodular worms from 22 pigs in 25 tests. The recrystallized drug, at dose rates varying from approximately 0.05 to 0.2 Gm. per pound, removed 19.7 per cent (101) of 512 immature ascarids, 57 per cent (121) of 212 mature ascarids, and 87.6 per cent (583) of 665 nodular worms from 14 pigs in 20 tests. This report was a detailed account of data presented previously in abstract form.²⁰ In summarizing the data in this paper, corrections have been made for errors that were detected in tables and in the discussion. With reference to toxicity, it was stated that 40 pigs, to which conditioned phenothiazine was given in the feed at the rate of 0.5 Gm. per pound of body weight, showed no signs of intoxication. Either nephritis or enteritis or both, of varying degrees, were produced in 6 of 8 pigs, weighing from 150 to 450 lb. each, that were given approximately 1 Gm. per pound of the conditioned product in single or multiple doses. A mild enteritis, however, was found in one of an unspecified number of controls. Doses of conditioned phenothiazine ranging from 3.5 to 50.0 Gm. caused no intoxica-

tion in 21 pigs whose weights ranged from 7 to 59 lb.

In the *Report of the Chief of the Bureau of Animal Industry*, 1940,²² it was stated that phenothiazine, given in the feed at various dosages, removed more than 92.0 per cent of the nodular worms from 36 pigs, and that it seemed to be as effective as oil of chenopodium for the removal of ascarids except when only a few worms were present. The drug was said to be much less effective against immature ascarids than against those that were full grown.

Toxic symptoms following the administration of phenothiazine to pigs were reported by Lapage,¹¹ in September, 1940. Incoördination and unconsciousness were observed in 10 pigs, weighing 35 lb. each, that were given individual dosages of 0.5 Gm. per pound. Two similar groups of pigs were given 0.2 and 0.1 Gm. per pound, respectively, on two successive days as a mass dose in the feed. Incoördination was noted after the second dose in each group, although 1 pig in the former group showed slight weakness after the first dose. No deaths occurred in any of these animals. No symptoms of toxicity were observed in 29 pigs that were individually given 0.1 to 0.5 Gm. per pound of body weight in single or repeated doses. Although no critical data were given, the writer stated that the ascarids were not removed from these pigs.

As determined by fecal examination one week after treatment, Boley, Levine, Wright, and Graham,⁴ in January, 1941, observed that a dose of 20 Gm. per animal was entirely effective against ascarids and 89.0 per cent effective against nodular worms in 14 pigs weighing from 80 to 150 lb. In a similar test, ascarid and nodular worm egg counts were reduced 72.0 and 95.0 per cent, respectively, in a group of 12 pigs, weighing approximately 120 lb. each, that was given 288 Gm. in the feed.

Bryant,⁶ in April, 1941, reported toxic symptoms in a group of 47 pigs, weighing 18 to 30 lbs., that was given 6 to 8 dr. per animal of a commercial suspension one afternoon. The next morning 2 pigs were dead, 5 were prostrate, and others showed symptoms of incoördination, particularly in the hind quarters. In all, 23 of the animals were affected with varying degrees of paralysis. Postmortem examination of one of the latter revealed a moderate hepatitis and nephritis. Although no critical data were given, the writer stated that large numbers of worms were discharged.

In August, 1941, Roberts²³ reported that phenothiazine, at dose rates of 0.2 to 1.0 Gm. per pound of body weight, removed 63.5 per cent (100) of 157 ascarids from 7 pigs; and that dose rates varying from 0.2 to 2.0 Gm. per pound, removed 92.0 per cent (2,119) of 2,305 nodular worms from 12 pigs. Inappetence, depression, constipation, and incoördination were

observed in 4 pigs that were given dosages of 0.8 to 2.0 Gm. per pound of body weight. In addition to the foregoing, marked gastritis and ulceration were found in the pig receiving 2.0 Gm. per pound, a total of 78 Gm. One pig, weighing 64 lb., was given 10 Gm. daily for ten consecutive days and the only reaction was slight constipation. These studies indicated that dosages up to 0.4 Gm. per pound of body weight were fairly well tolerated, the only ill effects being temporary inappetence and constipation.

Lekwa,¹⁷ in September, 1941, observed nervous symptoms and paralysis twelve to eighteen hours after administering a commercial suspension, although the dosage was less than that indicated on the label. These pigs showed an increased thirst, and they would drink if held to the trough even while paralyzed. Some pigs did not show toxic symptoms until two days after treatment. Recovery usually followed within a day or two, the mortality rate being very low. There was no indication of anemia, and the paralysis had no apparent permanent after effect.

Threlkeld and Johnson,¹⁸ in January, 1942, gave 20 Gm. of unconditioned phenothiazine in the feed to each of 3 pigs weighing between 45 and 50 lb. each. Ascarids, nodular worms, and stomach worms were recovered from the feces after treatment, and weekly fecal examinations over a period of two months indicated that the animals were comparatively free of gastrointestinal parasites. Sixty-five days after the initial treatment, 2 of the 3 pigs were given multiple doses of phenothiazine and the other was used as a control. Studies were made on changes in erythrocyte and leucocyte counts and in hemoglobin concentrations in these animals. One pig was given 50 Gm. in 5 equal doses in the feed at three-, four-, and five-day intervals over a period of sixteen days; the other was given 60 Gm. in 3 equal doses at five-day intervals over a period of ten days. No significant differences were observed in blood studies of the 3 pigs. Field treatments of hogs with small daily doses of phenothiazine in the feed for the removal of kidney worms were not effective. Limited tests indicated, however, that there was some inhibitory effect on the hatching of eggs and on the development of infective larvae of the kidney worm in pigs treated with the drug.

In studies to determine the effect of phenothiazine on the blood of swine, McCulloch and Seghetti,¹⁹ in February, 1942, concluded that the amounts of the drug usually recommended for swine possess a large factor of safety, but that the daily administration of much larger doses over long periods of time produced a marked and significant, although not a fatal, decrease in the hemoglobin concentration of the blood and in the erythrocyte count. In view of the

limited number of pigs that were used in the tests, however, the weight changes of the experimental animals were of more interest to us than the changes which occurred in the blood pictures. In both tests, the control pigs made greater weight gains than the pigs that were given daily therapeutic doses of the drug. Moreover, the pigs that were given the drug in doses above the therapeutic level, either daily or at intervals of fifteen days, made greater weight gains than either of the control pigs or of the pigs that were given daily therapeutic doses. These results may have been occasioned by constitutional differences among the experimental animals or, as seems less likely, by a growth-promoting action of the drug. It was noted that 4 ascarids were found at necropsy in a pig that had been given a daily therapeutic dose of phenothiazine for seventy-four consecutive days.

Thorning, Morrill, and Boley,²⁰ in March, 1942, reported toxic symptoms in a group of 112 weanling pigs weighing 10 to 30 lb. The pigs were fasted for thirty hours and given 909 Gm. of the drug in corn and oats slop, a theoretical dose of 8.11 Gm. per animal. Approximately ten hours after treatment, only 12 of the pigs could stand, and the others showed varying degrees of incoordination, blindness, corneal opacity, and unilateral or bilateral keratitis. About thirty hours after treatment, half the pigs were able to walk normally again. Two runts succumbed eighteen hours later, however, and 26 others were still unable to rise. A majority of the pigs recovered before the sixteenth day although 6 were affected for a longer period. Postmortem examination on 1 pig, eleven days after treatment, revealed diffuse yellowish discoloration of the liver.

At the same time that the above article appeared, Hover¹² stated that phenothiazine, in his experience, was "very good" against ascarids, "quite satisfactory" against whipworms, and "fairly good" against thorn-headed worms. This seems to be the only assertion of favorable action of phenothiazine against the last two parasites; no data were given, however.

In April, 1942, Rietz²¹ reported toxic symptoms in several groups of young pigs after treatment with phenothiazine. Incoordination, constant spasmodic ocular movements, and prostration were observed in a group of 16 pigs, 4 weeks of age, that was given 5.0 Gm. per animal as a drench. Two pigs died, but the others were apparently normal within forty-eight to seventy-two hours. Postmortem examination of the 2 pigs failed to reveal any significant pathology. Previously, a group of 90 pigs 8 weeks old and a group of 31 pigs 4 weeks old had been drenched with 6 and 5 Gm. per animal, respectively, without untoward reactions. A severe dermatitis was observed in another group of 45 pigs after the second

of 2 doses of phenothiazine, given at an interval of four weeks. Lesions of necrotic enteritis were found in 7 pigs of the group that died. In lieu of a second dose of phenothiazine, 41 pigs of the same age were given oil of chenopodium. Although placed in the same hog lot as the preceding group, no dermatitis developed in any of them.

Swales, Albright, Fraser, and Muir,²⁰ in June, 1942, described a transitory, serous dermatitis in Yorkshire pigs treated with phenothiazine and exposed to sun rays. Large, painful fissures developed in the affected areas, and after subsequent scab formation the lesions healed in about fifteen days. Pigs maintained indoors did not develop skin lesions and were apparently unaffected by the treatment. Inappetence, nervous symptoms, and incoördination also were observed in pigs treated with recommended doses.

Fistler,⁷ in the fall of 1942, encountered toxic reactions in a group of 64 pigs, weighing about 35 lb. each, that was given 12.5 Gm. per animal of a commercial suspension. The next day about a third of the pigs showed posterior paralysis. Autopsy was held on 1 runt but no significant pathology was noted; a few ascarids were found in the small intestine, however. All of the affected pigs showed improvement the second day except that some were apparently blind. A few days later all of the pigs had recovered.

In the *Report of the Chief of the Bureau of Animal Industry*, 1942,²¹ it was stated that doses of 8 to 12 Gm. removed 40.0 per cent (16) of 40 ascarids, 62.0 per cent (254) of 409 nodular worms, and 3.0 per cent (11) of 318 whipworms from 5 pigs weighing from 31 to 63 lb.

In April, 1943, Lapage¹⁶ reported incoördination, weakness in the hind legs, inability to stand, and lethargy in 14 of 24 pigs that were given from 0.1 to 1.0 Gm. per pound of body weight. Although 4 pigs died, death was attributed to inhalation pneumonia or to traumatic injury during dosing. The writer stated that responses of individual pigs to phenothiazine appeared to be erratic and incalculable regardless of age or dose rate employed.

Britton,² in October, 1943, reported toxic reactions in 64 pigs, weighing from 45 to 60 lb., that were given the drug in grain at the rate of approximately 11.7 Gm. per animal. Within twelve hours, all pigs showed posterior paralysis, marked incoördination, circling, and stupor. A few vomited and 20 showed prolapse of the rectum. All pigs passed large numbers of ascarids, and within five days all were normal except a few that developed a temporary corneal opacity. In view of a pretreatment diagnosis of necrotic enteritis, ascariasis, and secondary pneumonia, the writer postulated that the enteritis allowed greater absorption of the drug or its oxidation products than would normally have occurred.

Jones,¹³ in December, 1943, reported severe reactions and several deaths in 3 groups of pigs treated with phenothiazine preparations of unknown composition. Each of 6 sows, averaging 350 lb., was given 4 tablespoonfuls of a phenothiazine preparation in the feed; 4 of the sows died 29 or more days after treatment. In a herd of 150 mixed shoats weighing 80 lb., 33 died nineteen or more days after treatment, and in a third group, 5 pigs, weighing 40 lb. each, died three to four weeks after treatment; in neither instance was the dosage of phenothiazine specified. The writer stated that the affected animals had a chronic diffuse nephritis, with uremia responsible for the deaths, and postulated that adulterants or fillers incompatible with phenothiazine had been added to the powders.

In January, 1944, Andrews and Connelly¹ reported the successful treatment of 15 brood sows for nodular worm infections, employing approximately 0.1 Gm. per pound of body weight. Egg counts were markedly reduced after treatment, and there were no apparent harmful effects to the sows or pigs. Treatments were given before or after farrowing which occurred, in either case, within four to eleven days of treatment.

In unpublished tests conducted at the Zoölogical Division, 15 pigs, weighing from 16 to 100 lb., were given 4.6 to 12.0 Gm. of phenothiazine in the feed. The treatment removed 56.0 per cent (180) of 320 ascarids and 90.0 per cent (2,099) of 2,321 nodular worms from these animals. The treatment was relatively ineffective against stomach worms (6/235), whipworms (22/487), hookworms (13/25), and thorn-headed worms (0/52). A dose of 40 Gm. removed 100 per cent of 119 nodular worms but none of 19 stomach worms from 1 pig weighing 177 lb. A pig weighing approximately 150 lb. was given 20 Gm. of the drug in feed but no ascarids were recovered after treatment. About two weeks later, the pig was given 5 cc. of oil of chenopodium and 3 mature ascarids were recovered in the feces. The pig was not available for postmortem examination, but the efficiency of the latter treatment was indicated by egg counts which were reduced from approximately 24,000 to 0 eggs per gram of feces.

From the reports in the literature it is apparent that the ascaricidal action of phenothiazine in swine is quite variable. Moreover, satisfactory action appears to be limited to pigs heavily infected with mature worms, for the drug was rather ineffective against immature worms and against mature worms present in relatively small numbers. On the other hand, the anthelmintic action of the drug against nodular worms appears to be highly satisfactory. With respect to safety, the drug seems to be rather well tolerated by older animals, but young pigs not infrequently react unfavorably to treatment.

In the reports in which complete critical data were given, phenothiazine, conditioned and unconditioned, removed only 45.0 per cent (735) of 1,632 ascarids but 90.0 per cent (9,927) of 10,981 nodular worms from 68 pigs in 77 tests; ascarids were present in only 63 of the pigs. There are reports of at least 59 deaths associated with treatment with phenothiazine, but these cannot be definitely attributed to a toxic action of the drug in all instances.

Sodium Fluoride.—Apparently the only scientific data pertaining to the anthelmintic action of sodium fluoride in swine was published in 1945 by Habermann, Enzie, and Foster,⁸ although a progress report appeared in the *Report of the Chief of the Bureau of Animal Industry*, Agricultural Research Administration, 1944.¹⁰ A total of 152 tests was made with 128 pigs, mostly in very poor condition, to which the chemical was given in dry feed, usually for one day, at rates of 1.0, 1.5, 2.0, 4.0, and 5.0 per cent of the feed mixtures. The higher concentrations were used primarily to ascertain the tolerance of pigs for the chemical and to observe the symptomatology of acute fluorine poisoning in these animals. The efficacies against ascarids in the several tests ranged from 0 to 100 per cent (average, 98.0 per cent) and against stomach worms from 7.0 to 100 per cent (average, 95.0 per cent); the anthelmintic action against nodular worms and whipworms was insignificant. At the lowest dosage tested; namely, 1.0 per cent for one day, the treatment removed 97.0 per cent (262) of 270 ascarids from 52 pigs. Among the latter there were 2 deaths, 1 from pneumonia and the other possibly from toxic reaction, and 2 pigs that were observed to be in very poor condition on and following the third day after treatment. The others showed no ill effects other than occasional vomiting, in spite of the fact that the experimental pigs, as a whole, were poor risks for medication on account of their very poor condition. Feed mixtures containing as much as 4.0 or 5.0 per cent of the chemical were highly dangerous; of 2 pigs tested at each dosage, only 1 on the 4.0 per cent mixture survived, although the other pig similarly treated showed lesions of pneumonia at necropsy. The writers emphasized that their investigations were still in progress and did not recommend the chemical for other than experimental use.

EXPERIMENTAL SECTION

Materials and Methods.—The 66 pigs used in these tests were culls of mixed breeds in rather poor physical condition. They ranged from 3 to 8 months of age and weighed from 12 to 90 lb. each. Most of the pigs harbored one or more of the intestinal helminths commonly encountered in swine in this locality; namely, large roundworms (*Ascaris lumbricoides*), stom-

ach worms (*Ascarops strongylina*), nodular worms (*Oesophagostomum* spp.), and whipworms (*Trichuris suis*). The pigs treated with oil of chenopodium and phenothiazine were confined in adjacent concrete-floored pens, and the sodium fluoride group was treated concurrently in a similar pen. The pigs were confined for one or two days before treatment and the feces examined daily in order to detect natural elimination of parasites. Prior to treatment the species of parasites in each animal were determined by fecal examination, using the salt flotation method. Oil of chenopodium and phenothiazine were given by customary methods, and sodium fluoride was given according to a method described in a previous paper.⁸ The feces were collected daily and examined for ascarids. When the elimination of these parasites ceased, usually within six days, the pigs were submitted to necropsy and the entire gastrointestinal tract examined for parasites and lesions. The other organs were examined macroscopically for evidences of pathological changes. The data are given in table 1.

RESULTS

Oil of chenopodium was given to the pigs *via* stomach tube at the rate of 0.05 cc. per pound of body weight and while the tube was still in place, an appropriate dose of castor oil was forced through the tube with a dose syringe. The pigs were fasted for twenty-four hours before treatment and were returned to regular feed about two hours afterwards. The treatment removed 86.0 per cent (86) of 100 ascarids from 20 pigs. The efficacy of the drug against other parasites was not determined, but at necropsy 815 nodular worms, 19 whipworms, and 1 stomach worm were recovered from the group. Several pigs vomited shortly after treatment, and on the fifth day 1 runt was found dead. At necropsy no ascarids were found in this pig, and the principal lesions encountered were hemorrhagic gastroenteritis and a few petechial hemorrhages in the kidneys.

Phenothiazine was given to the pigs in the regular feed at the rate of 0.2 Gm. per pound of body weight. The pigs were not fasted before treatment but were given only about two thirds of their regular feed the previous day. The mixture was eaten promptly, and red-stained urine was observed within five hours. The treatment removed less than 1.0 per cent (4) of 390 ascarids from 20 pigs, but only 8 nodular

worms and 2 whipworms were recovered from the group at necropsy. Red-stained urine was the only host reaction in these pigs.

Sodium fluoride, 150 Gm., was given to the pigs as a 1.0 per cent mixture of the regular feed and the entire mixture was consumed the first day. The pigs were prepared for treatment in a manner similar to that employed for the phenothiazine-treated group. The treatment removed 100 per cent of 23 ascarids from 26 pigs; 84 nodular worms and 61 whipworms were recovered from the group at necropsy. One or 2 pigs vomited after treatment, and on the sixth day 1 pig was found dead. No ascarids were found in this pig at necropsy, and the lesions encountered were hemorrhagic gastroenteritis and nephritis, cirrhosis of the liver, and congestion of all lymph glands. The rest of the animals remained normal throughout the test period. The data for sodium fluoride were included in a previous paper by the writers.⁸

On the third day after treatment, 1 pig from the phenothiazine-treated group was found with the pigs that had been treated with oil of chenopodium. Since these two

that the pig harboring 70 ascarids at necropsy had probably escaped from the phenothiazine-treated group. In any event, the data on this pig are unimportant in computing the efficacy of phenothiazine against ascarids in this test, although they would be of considerable significance if the pig had been treated with oil of chenopodium, for such occurrence would attest the variability or occasional ineffectiveness of the drug as an ascaricide in swine. Hence, we have taken the conservative alternative in assigning this pig to the phenothiazine-treated group.

Comments on Experimental Data.—In these comparative tests, the anthelmintic action of the three compounds conformed, in general, with their published records, although there were some minor departures. The ascaricidal action of oil of chenopodium was slightly higher than that in the published data of critical tests but probably represented fairly well the ascaricidal action of the drug. Several pigs vomited after treatment and 1 died. Phenothiazine, however, was somewhat less effective against ascarids than expected although its action against nodular worms was apparently quite satisfactory. There

TABLE I—Data on the Anthelmintic Action of Oil of Chenopodium, Phenothiazine, and Sodium Fluoride in Swine

NO. OF ANIMALS.	WEIGHT (LB.)	-DRUG	DOSAGE AND MANNER OF TREATMENT	PARASITES REMOVED	EFFICI- CACY		REMARKS
					LEFT (%)		
20	12-35	Oil of chenopodium (with castor oil)	0.05 cc./lb. via stomach tube	Ascarids	86	14*	Several vomited; one died on fifth day.
				Stomach worms	—	1	
				Nodular worms	—	815	
				Whipworms	—	19	
20	21-28	Phenothiazine	0.2 Gm./lb. in feed	Ascarids	1	389*	None.
				Nodular worms	—	8	
				Whipworms	—	2	
26	40-90	Sodium fluoride	1 per cent of feed (150 Gms.)	Ascarids	23	0	One or 2 vomited; one died on sixth day.
				Nodular worms	—	84	
				Whipworms	—	61	

*See text.

groups of pigs were in adjacent pens and not otherwise identified, it was impossible to recognize with certainty the pig in question. At necropsy, however, 16 pigs in the chenopodium-treated group were free of ascarids; 5 infected pigs had 84 ascarids of which 70 were found in 1 pig. On the other hand, only 4 pigs in the phenothiazine-treated group were free of ascarids, but 15 pigs contained a total of 319 ascarids, 4 pigs harboring 44, 45, 49, and 67 worms, respectively. These data suggest

were no untoward reactions to the treatment. The pigs treated with phenothiazine and oil of chenopodium were of comparable age and weight and presumably had been equally exposed to parasitic infection. Although no attempt was made to recover the nodular worms eliminated from these pigs after treatment, the autopsy records suggest significant anthelmintic action against these worms by phenothiazine. The sodium fluoride group was somewhat older and apparently less heavily parasitized.

The ascaricidal action was complete, however, and compared well with that attained in the experimental tests reported previously.⁸ One or 2 pigs vomited after treatment and 1 died.

With reference to this trial, acknowledgement must be made of the unusually skew distribution of ascarids among the experimental groups; the average number per animal in the group treated with oil of chenopodium was 5, in the phenothiazine group, over 19, and in the fluoride group, less than 1. This irregularity militates against the truly comparative value of the data, yet in some important respects the results are more conservative on this account. It has been pointed out, for example, that phenothiazine exhibits its greatest efficacy in heavy infections; in this trial, therefore, the group best suited to demonstrate the action of this drug was used for this purpose. Conversely, it is possible that the group having the fewest worms was most suited to give a conservative result with the newest substance, sodium fluoride, although it appears that the efficacies of sodium fluoride and oil of chenopodium are independent of the numbers of worms present. The findings in this trial, however, are of significance only in so far as they contribute to the whole body of information regarding the value of the three substances in question as general anthelmintics for swine.

DISCUSSION

In the foregoing sections, a summary has been presented of the literature on oil of chenopodium, phenothiazine, and sodium fluoride as anthelmintics for swine, the first two being the drugs that are currently in widest use and the third having been introduced only recently as a drug of promise for use in swine. In addition, new data have been presented on a comparative trial with these three anthelmintic substances in pigs.

In attempting to evaluate comparatively the three anthelmintics discussed herein, the fact should be emphasized that both oil of chenopodium and phenothiazine have been subjected to years of field use and clinical trials, but that sodium fluoride has no record of experience of this nature. For this reason, any interpretations regarding this last-mentioned substance, however

favorable, cannot be construed as an endorsement of this chemical for general use in swine. Like any new treatment, it can be properly evaluated only after numerous investigative studies and wide field use.

Considering all the available information, oil of chenopodium, when given in suitable doses, appears to remove about three fourths of the ascarids from pigs. The records of critical testing show that the drug removed 74.0 per cent (182) of 245 ascarids from 59 pigs, the data on 29 of which are reported herein for the first time. Considering, as a whole, the experience of workers in the U. S. Bureau of Animal Industry, it becomes apparent that the majority of the critical tests were made by these workers and that their results showed somewhat higher efficacies than those reported by others. In the tests reported by the Bureau, the drug removed 78.0 per cent (172) of 219 ascarids from 41 pigs. In this group, there were 2 deaths—the only deaths recorded among the animals subjected to critical testing—but only a few instances of severe intoxication. There are, however, records of at least 23 deaths from clinical trials, although some of the deaths were possibly due to improper administration of the drug or to extraneous causes. Mention has already been made of the disadvantage inherent in the variable ascaridol content of commercial products.

Phenothiazine is considerably less effective against ascarids than oil of chenopodium, although it possesses several special advantages over the latter drug. It requires no fasting or purgation, and may be administered in the feed to a group of pigs at one time; it also possesses effective action against nodular worms, an action which is not possessed by either oil of chenopodium or sodium fluoride. Regarding the specific ascaricidal action of phenothiazine, the critical information to date, including that given in this report, reveals that approximately 36.0 per cent (736) of 2,022 ascarids were removed from 83 test pigs, of which 35 are reported herein. The action against mature worms was usually, but not always, better than indicated by these figures. The evidence is less convincing that the efficacy of the drug varies with the number of worms present. In a real sense, the fact that phenothiazine works best against mature worms in heavy

infections, if true, is a distinct limitation in the efficacy and usefulness of the drug. Neither oil of chenopodium nor sodium fluoride appears to be subject to such limitation. Against nodular worms, phenothiazine has shown an average efficacy of about 90.0 per cent. Concerning its toxicity, phenothiazine appears to have been an infrequent cause of death among the animals used in critical tests; a wide range of untoward reactions has been noted, however, especially in young pigs. There are reports of at least 59 deaths among pigs that were treated with phenothiazine, but not all of these deaths can be ascribed to the drug. If judged from the relatively extensive literature that is now available, one must conclude that swine do not compare with other classes of stock in tolerance for this drug. In the experience of workers in this bureau, unusually severe reactions have been infrequent, although the efficacy of the drug appears to have been extremely variable and poorer, on the average, than that reported by other investigators.

The tests with sodium fluoride compare in number with those which have been made with the other two drugs in question, although the conditions under which this chemical has been tested have been limited. In tests with 124 pigs, sodium fluoride removed approximately 98.0 per cent (651) of 662 ascarids, these worm counts being based on the 103 animals on which precise critical data were obtained. About 95.0 per cent of the stomach worms, *A. strongylina*, were also removed. There was no significant action against nodular worms. In all, there were 4 deaths among the 124 pigs that were used in 148 trials with sodium fluoride. Most of the test pigs were poor risks for medication, and 3 of the deaths were complicated by pneumonia. The chief effects attributable to the chemical were occasional vomiting and soft feces. The minimal effective dose rate has not been determined; present information suggests only that the administration of the chemical at a rate not exceeding 1.0 per cent of the feed for one day is ample.

From the data at hand, therefore, it appears that sodium fluoride is a more effective ascaricide than either oil of chenopodium or phenothiazine, that it compares favorably with either of these as to safety, and that it possesses the special advantage of phenothiazine in being fully as

easy to administer. Sodium fluoride is, of course, available everywhere at low cost.

It cannot be emphasized too strongly, however, that these are not fixed conclusions; they are only the indicated comparisons from data at hand, since sodium fluoride requires much further testing before its usefulness as an anthelmintic for swine can be appraised with reasonable accuracy.

SUMMARY

In limited tests in swine, the anthelmintic action of oil of chenopodium, phenothiazine, and sodium fluoride compared favorably with that in the published data of critical tests. Oil of chenopodium removed 86.0 per cent of 100 ascarids from 20 pigs but was comparatively ineffective against other intestinal helminths. Several pigs vomited after treatment and 1 died. Phenothiazine removed less than 1.0 per cent of 390 ascarids (somewhat less than anticipated) from 20 pigs, but apparently was quite effective against nodular worms. The drug was well tolerated, red-stained urine being the only host reaction. Sodium fluoride removed 100 per cent of 23 ascarids from 26 pigs, but its action against other intestinal helminths was not determined. One or 2 pigs vomited after treatment and 1 died.

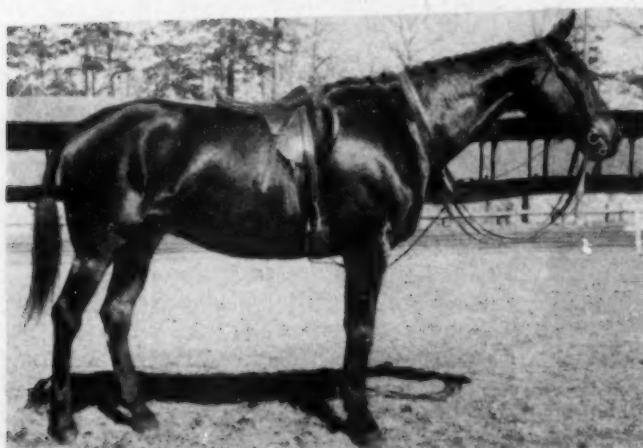
A review of the literature pertaining to the use of oil of chenopodium and phenothiazine as anthelmintics for swine, and limited comparative tests, permitted reasonably accurate evaluations of both drugs and fair comparisons between them. Coordinate consideration was given to sodium fluoride, allowance being made for the absence of clinical trials with this drug. Oil of chenopodium is more effective than phenothiazine against large roundworms, and its ascaricidal action is more uniformly reliable. Phenothiazine, however, is more easily administered and has the advantage of effective action against nodular worms. With respect to toxicity, both phenothiazine and oil of chenopodium have given rise to instances of intoxication and death, young pigs being more susceptible than older ones to intoxication with phenothiazine. In limited trials, sodium fluoride demonstrated a significantly superior ascaricidal action in pigs, was as well tolerated as either of the above-mentioned drugs, and was easy to administer. Much more extensive testing will be necessary, however, before the

safety and anthelmintic value of sodium fluoride can be properly evaluated.

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Good for Sore Eyes



This is "Wisdom," Thoroughbred Heavyweight Hunter, property of Urton Munn, D.V.M., Route 5, Atlanta, Ga. Sire "Good Advice," dam "Sun Kiss," height 17 hands, weight 1,350 lb., but the picture tells the better story.

Diseases of Dairy Cattle and England's Milk Supply

(An Abstract)

The full dress debate on this subject, which took place in the House of Lords early in April, undoubtedly represented a significant stage in the campaign conducted for combating major diseases of dairy cattle—for the dual purpose of protecting the public health and of increasing the milk supply of the nation.

Viscount Bledisloe, in presenting an extensive review of the problem, said there was little ground for national pride in regard to the home-produced milk. Exclusive of tuberculosis, four diseases are causing an annual loss of about £20 million and 200 million gallons of milk. They are mastitis, brucellosis, sterility, and Johne's disease. This is an estimate based on information that the milking life of the dairy cow is only half of what might be expected under ideal conditions, and that 58 per cent of the animals removed from the herds are culled on account of disease. It is also estimated that 80 per cent of the loss is preventable.

Great Britain, he continued, compares unfavorably with most of the other civilized countries of the world in the matter of the general supply, quality, and the individual consumption of milk, as well as in the yield per cow, bovine diseases, veterinary treatment, and the number and qualifications of her veterinarians. That the Prime Minister is cognizant of the situation is revealed by his recent statement that there is no better investment for the nation than to put milk into babies; but, according to the viscount, he might have added: provided it be pure and safe and free from pathogenic germs of both bovine and human origin.

In this connection, Viscount Bledisloe said that figures indicated that the annual milk production per cow is increased almost in the proportion that the number of veterinarians is increased, because, with the improved veterinary supervision, there is less disease and better treatment of the cows.

It was brought out that an estimated 40 per cent of the dairy cows of England are tuberculous, and the annual loss from this disease is approximately £3 million. An additional 25 per cent of the cows suffer from mastitis, and 40 per cent from brucel-

losis. Johne's disease is less widespread, but is serious in some areas. This degree of prevalence is mainly due to failure to apply known methods of control.

In closing, the M.P. stated that Britain and France are the only countries in Western Europe having less than 100 veterinarians per million head of the larger domestic animals, and that a need existed for drastic methods, such as more definite objectives and more haste in adopting practical methods for achievement. He presented eight steps which should be taken in a long-range government program: (1) proper survey of the incidence of disease; (2) increase the bonus for milk from herds free from tuberculosis and, so far as known, from other diseases; (3) establish a free state veterinary service; (4) mark the cows removed from herds under test or supervision; (5) compulsory Brucella vaccination; (6) compulsory health service similar to the "Panel" scheme; (7) establish disease-free areas; (8) establish state abattoirs.

In the free debate which followed this opening presentation, the Duke of Norfolk, Joint Parliamentary Secretary, Ministry of Agriculture, mentioned three new measures which had been introduced recently: the Panel scheme to control diseases of dairy cattle, which consists of a periodic visit by a veterinarian to the herd at least quarterly, to check on and control four specific diseases (mastitis, brucellosis, sterility, Johne's disease) at a specified cost per head, the government supplying laboratory service and certain vaccines free, and other products (sulfanilamide) at a low rate. About 10 per cent of the cattle are now enrolled under this plan, and expansion is impossible because there are not enough veterinarians available for herds whose owners wish to enroll them. The second measure is the scheme for brucellosis vaccination of calves, and the third is the provision by the government of expert assistance to veterinary surgeons on sterility problems. In closing, he paid tribute to the work done by the veterinary service.

Other members of the House of Lords who entered into the debate, and a brief summary of the themes used, are as follows:

Lord Cranworth—These losses must cer-

tainly be reduced and they can be by providing better housing and better veterinary service.

Earl of Ievagh—The most important thing is to get more accommodation for the training of veterinarians.

Lord Addison—An adequate supply of properly trained veterinary surgeons will not be available unless a great extension of veterinary colleges is undertaken and proper remuneration given to their staffs.

Lord Moran—Milk is the keystone of national nutrition and it is regrettable that fewer than 50 people are engaged in dairy research in England and Wales.

Earl of Warwick—Many veterinarians assert that 80 per cent of dairy cattle disease can be dealt with if the conditions of the buildings, farm education, and management procedures can be suitably improved.

Lord Geddes—Bacteriologic research has not seemed to get at the bottom of the trouble, and the place of nutrition in mas-

titis and other diseases should be studied carefully.

Earl De La Warr did not agree that disease has greatly increased, but only that more diseases are brought to light. He emphasized the need for using the knowledge already available.

Lord Glentanar—A continuous supply of milk for human use must come from maintaining a relatively large number of cows in health, through a normal life period.

Lord Teviot—Field tests have much more value than laboratory tests, and should be used on a broader scale.

Earl of Listowell, Under-Secretary for India—Milk consumption on an increased basis would do more than anything else to improve the national standard of physical fitness; never forgetting the infectious diseases of human beings, as well as those of animals, which may be carried into the homes by milk.—*From Veterinary Record, April 21, 1945.*

Mules in Italy



—Signal Corps, U. S. Army Photo

Mules in corrals at the Peninsular Base Section Remount Station in Italy.

The spectacular advance of the 10th Mountain Division towards the end of the victorious Italian campaign was made possible because of the prompt delivery of mules and supplies to these fighting Fifth Army troops. They now have 50,000 "prisoners of war"—German horses captured by the Allies in Italy.

Breaking the Killing Habit in Dogs by Inhibiting the Conditioned Reflex

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WHEN DOGS develop bad habits, such as killing chickens or sheep, the veterinarian is often consulted concerning treatment. If the dog is valuable or a beloved pet, the owner demands something more than the mere killing of the guilty animal, no matter how quickly and kindly the destruction is carried out. The usual punishments are often ineffectual. By following psychologic principles, much can be done to break the bad habit without injuring the dog.

Pavlov¹ has shown, by extensive experiments with dogs, that the conditioned reflex is the basis of most animal behavior. In its simplest form, this is the eliciting of a given response by a stimulus other than the natural one. Thus, a puppy that has never tasted meat will not begin to drool saliva until meat is placed in his mouth, the flow of saliva being a natural, direct response to the stimulus of taste. But any dog that has been fed meat before will begin to drool saliva at the sight or smell of meat. Here the visual or olfactory stimulus takes the place of the original unconditioned stimulus of taste in evoking the salivary response. Thus, the response to the sight or smell of meat, rather than to its taste, is said to be a conditioned reflex. If a certain noise, such as the ringing of a bell, is made just before feeding, after several repetitions, the noise itself will cause a flow of saliva. It is as if an association of ideas were formed in the dog's mind. Similarly, conditioned reflexes of this type can follow a variety of visual, auditory, olfactory, and cutaneous stimuli, after the conditioned stimulus has been associated with the original unconditioned stimulus often enough for the dog to learn. This type of reaction is important in the behavior of all animals. Many such reflexes develop naturally in the animal's everyday life from natural associations. Thus, the approach of their usual feeder will bring hogs and poultry running expectantly; the rattle of milk pails will cause some cows to drip milk, and many other such examples of animal behavior can be easily recalled by any-

one with farm experience. Animal training depends largely on the building up of such conditioned reflexes, so that the stimulus of the trainer's command or gesture will call forth the desired response in the animal. The more intelligent the animal, the more complicated the reflexes that can be built up.

The conditioned reflex enters as much into the formation of harmful habits as it does into harmless ones. When the sight of a chicken or sheep becomes a stimulus for a dog to kill, something obviously must be done to inhibit the undesirable conditioned reflex, if the owner is to keep the dog. Destroying the dog is unintelligent and unnecessary. Any conditioned reflex can be inhibited by repeating the conditioned stimulus a number of times without permitting the reflex to proceed further along its accustomed course. It is as if the dog eventually forgets the association of ideas it has formed. Thus, in a chicken-killing dog, if the dog is surrounded by chickens without being able to kill them, the stimuli of the sight, smell, and sounds of chickens will eventually cease to suggest killing. When the dog is freed, after a few weeks of close association with his former victims, he will no longer be interested in killing them.

This principle has been successfully tested under farm conditions. The first case was that of two sheep-killing Great Danes. These dogs killed a stray ewe just after she had dropped a lamb. They overlooked the newborn lamb; it was saved and survived with bottle-feeding. A heavy wire pen was erected for this and another lamb directly in front of the Great Danes' kennel. The dogs were left at large. For the first few days the lambs were in their new pen, there was much excitement on the part of the dogs, with barking, drooling, snapping, and rushing at the wire fence. After a few days, they became gradually less concerned with the lambs and at the end of a few weeks paid no attention to them at all. The fence was then removed. The lambs continued to

graze within easy reach of the dogs, but by now the conditioned reflex had been thoroughly inhibited; the dogs had lost all interest in the sheep, and there was never any more sheep killing by those dogs.

The second case was that of a chicken-killing Dalmatian bitch, which had just weaned her first litter of pups. Chickens were killed and brought to the pups as well as eaten by the killer herself. Whippings had no effect on her behavior, the conditioned reflex being too strong to be affected by any fear of punishment. To inhibit this reflex, she was put in a stout pen in a hen-house, so that she could see, hear, and smell chickens all around her without being able to reach them. This also isolated her from her pups. She was kept in the hen-house for one month, being taken out only for regular feeding and daily exercise. At first, she exhibited considerable excitement, but as time went on she lost all interest in the surrounding poultry. On being released after a month, she showed no inclination either to chase chickens or to care for her pups. These pups had started killing poultry for themselves before she was separated from them, so they were similarly confined in another hen-house, and similarly cured of their chicken killing.

These cases are admittedly few, being confined to the writer's own dogs, but the uniformly good results in these cases suggest that it is a method worthy of wider trial. It is to be noted that, under extraordinary circumstances, a recurrence of the conditioned reflex can theoretically happen. Thus it is possible that in the above cases, some extreme excitement in the Great Danes might lead them to kill again, or excessive maternal solicitude when weaning the next litter of pups might lead the Dalmatian to again kill chickens. The owner should, therefore, be warned that vigilance should be maintained, so that if further treatment is necessary it can be instituted without delay. Under ordinary conditions, no recurrence of the undesirable habit occurs.

SUMMARY

A simple, harmless, and effective method of breaking killing habits in dogs is described, based on the fundamental psychology principle of the conditioned reflex, and

illustrated by cases of successful cures among the writer's own dogs.

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Vivisection

An editorial in the *Journal of the AMA*, June 30, 1945, discusses the latest friction between medical schools and antivivisectionists. Charges have frequently been made, but have never been proved. A lieutenant colonel just returned from overseas service writes: "There can be no dispute that surgery in this war is saving lives and limbs of thousands of servicemen who would die had their surgeons been less well trained—and had they not at least begun their training by vivisection."

The Multiplying K-9 Population, and Why

Quoting William S. Dutton, *Sportsman's Year Book* declares that the dog population of the United States has tripled in the last six years — 5,000,000 to 15,000,000, of which 12,000,000 are licensed, 60,000 registered with the American Kennel Club, and 55,000 contested at bench shows and field trials last year. The cost of feeding this segment of the country's animal population is \$547,000,000 a year, not counting the expense of building and maintaining kennels, of equipment (blankets, leashes, harness, etc.), wages, dog shows, travel, etc., which bring the total to upward of \$600,000,000 a year. How come the sudden aggrandizement? It appears that the "dog business" is the child of the financial crash of 1929 which wrecked the fortunes of many an elderly couple and drove them to the country to pursue some hobby as a means of livelihood. Among these were flourishing crossroad kennels of unexpected number and capacity, which caught the eye of passing millions. "A little tail-wagger is mighty liable to whine his way into your heart—and a new home," the raconteur adds. As Ellery Queen might have said, "There's your answer."

Occasionally, penicillin may cause symptoms simulating serum sickness—this may occur as a delayed reaction.

Tests of the Safety of Phenothiazine for Cattle

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PHENOTHIAZINE has been widely used as an anthelmintic for the removal of gastrointestinal nematodes from cattle, as well as from other classes of livestock, and the results generally have been satisfactory. A few reports have come to our attention, however, in which unfavorable reactions in cattle were attributed to the use of this

in a herd of yearlings of mixed breed in which heavy losses from gross parasitism had occurred for some time.

The present studies, prompted chiefly by the above-mentioned reports of apparent intoxication, were made to test the tolerance of cattle of relatively large doses of the drug. The tests included 14 calves, 2 of

TABLE 1—Toxicologic Data on Calves Treated with Phenothiazine While on Normal Diet (Ground Grain and Alfalfa Hay)

CALF	AGE MOS.	WEIGHT LB.	PHENOTHIAZINE ADMINISTERED			RESULTS
			DAILY DOSE IN GM.	DAYS DOSED	TOTAL DOSE IN GM.	
413	6	160	100	1	100	Not toxic
401	7½	260	250	1	250	Toxic†
414	9	250	70	2	140	Not toxic
484	5	220	100	2	200	Not toxic
355	12	320	95	3	285	Not toxic
495	7	213	100	3	300	Not toxic
432	7	185	23	6	138	Not toxic
484*	6	240	10	10	100	Not toxic
414*	9½	260	10	10	100	Not toxic
512	7½	202	10	17	170	Not toxic
553	4	185	8	56	...	Not toxic
564	4	155	8	54	...	Not toxic
555	5	192	8	55	...	Not toxic
542	6½	205	8	54	...	Not toxic

*Second course of treatment; †See text.

drug, one reporting temporary blindness, and another reporting anemia and death in poor and weakened animals. These and other reports have discouraged some veterinarians from using phenothiazine or from administering sufficiently large doses to achieve the best results.

The dosage of phenothiazine currently recommended by the Bureau of Animal Industry is 20 Gm. per hundredweight, with a maximum of 60 Gm. per animal. The literature contains records of the administration of larger doses without untoward effect. In earlier work reported from this station, for example, Porter, Simms, and Cauthen¹ gave doses from 120 to 240 Gm. or from 25 to 49 Gm. per hundredweight, to 2, 2-year-old Hereford bulls, without toxic effects. These authors also reported no intoxication from recommended doses of the drug

which were fed ground white corn and Johnson grass hay, because Woolf and Simms² had observed that horses maintained on this diet appeared to develop anemia following treatment with phenothiazine more readily than horses that were maintained on a diet of oats and alfalfa. The other 12 calves were fed a ration of ground grain and alfalfa hay.

RESULTS

Table 1 gives the ages, weights, and dosages of phenothiazine that were given to the animals receiving ground grain and alfalfa hay. These animals had been used for experimental infection in a project on the study of gastrointestinal nematodes of cattle at this laboratory. The large doses of phenothiazine were given primarily to remove *Cooperia* species in order that the host animals might be used for experimental infection with other species of nematode parasites. In most cases, the animals were passing relatively few ova and were in good

From the Regional Animal Disease Research Laboratory, Bureau of Animal Industry, Agricultural Research Administration, U. S. Department of Agriculture, Auburn, Ala.

saline solution. The muscles and peritoneum and serous surface of the rumen, if properly secured, will not be soiled. Clamp the rumen shut with the forceps, inverting the edges of the wound, and let the cow up. The rumen is now pulled to the surface with two of the forceps, one at the top and one at the bottom, and



—After Seagraves, 1945

Fig. 3—Showing the sutured wound, partially obscured by a switch of the tail, and a satisfied owner.

closed with a continuous No. 1 chromic gut suture. Larger size gut is harder to use, less readily absorbed, and is unnecessary. If the inversion of the edges is well done, one row of suture is adequate. The peritoneum must be drawn together well. The continuous suture is faster and preferable to interrupted ones. The skin is closed loosely with interrupted linen sutures. Fasting for a few days is imperative as in the handling of any severe bloat when the muscularis has been fatigued by prolonged stretching.

The operation can be done in forty-five minutes, not more than one hour from the time one arrives. This is in contrast to the time-consuming use of the trocar and antiferments *via* the stomach tube, which operation, likely as not, is followed by nasty abscesses. This technique presages a live cow, a satisfied client, and a veterinarian happy over his skill in coping with a difficult case.

I am indebted to Dr. Lavon Koger, Ontario, Ore., for the photography and assistance in this case.

The former theory that nerve blocking prevents shock is no longer entertained seriously by the modern surgeon. Blood loss, to which the veterinarian would add blood pooling, is the prime factor.

A Measure for the Fertility of Sperm

Spermatozoa derive the energy needed for their movements chiefly through anaerobic metabolism, while most body cells derive energy through aerobic metabolism. In the anaerobic process, glucose is hydrolyzed into lactic acid which then undergoes further anaerobic cleavage. The oxidation takes place through liberation of hydrogen whereas aerobic oxidation is carried to the end products, carbon dioxide and water.

A measure of this anaerobic activity has been developed by Dr. Ed. Sorensen, based upon the use of a dye (methylene blue) which is highly colored when oxidized but uncolored when reduced or hydrogenized to the so-called leuco-form. Using special glassware and gelatin mediums, the test is conducted in a water bath held at body temperature.

A really fertile semen which contains about one million spermatozoa per cubic centimeter, of which 50 to 60 per cent are actively motile, will decolorize completely in ten minutes. Less satisfactory semen takes longer to decolorize, and any sample taking more than 30 minutes is considered unfertile.—*From Skandinavisk Veterinærtidsskrift*. 1942. Reprint furnished to us by Major Eugene Ingmand, V.C.

Drainage

A distinguished surgeon,* after a series of interviews and visits to large hospitals, comes out with the flat remark that drainage wicks and vents have "killed more patients than they have saved." Speaking from personal observations that, to a considerable extent, applies to the usual types of drainage employed in animal surgery where, with rare exceptions, the orthodox decree is "leave the vent at the bottom for drainage," whether there will or will not be anything to drain off. The general idea in drainage is that wicks do not make fluids run uphill and vents are not avenues of escape, unless entubed and the direction is down hill. As a rule, that stitch left out at the bottom for drainage doesn't do much draining unless the whole interior of the cavity is fashioned for free, uninterrupted flow to a wide open portal.

*Dr. R. C. Chaffin in *Medical Times*, February '45.

Intravenous Alcohol Anesthesia

Anesthesia induced by intravenous injection of alcohol and glucose solution is widely practiced in the Russian army (*J.A.M.A.*, May 12, 1945). It has the advantage of being more completely metabolized to CO_2 and H_2O than ether and chloroform, and quickly brings about sleep and analgesia. The recommended dose is 1.5 to 3.0 cc. per kilogram of body weight. The lethal dose is 7.7 cc. per kilogram. The margin of safety is considerably less for chloroform and ether, which is 1.5 mg./100 cc. for chloroform and 4 mg./100 cc. for ether. A person weighing 130 lbs., for example, is given 120 cc. of alcohol and 240 cc. of 5 per cent glucose, by the drip method. The mixture is prepared for immediate use, and is given with the standard apparatus used for intravenous injections. When sleep sets in, the tube is clamped and when signs of awakening appear, the drip is resumed. Sleep begins after 40 to 60 cc. have dripped into the vein and lasts from two to five hours. Upon awakening, the patients are irrational and require special attention. The report is based upon 30 operations. Assuming that the reactions of animals will be similar, the veterinary surgeon need only compute the dosage on the basis of body weights.

Cancer in Cows' Udders Extremely Rare

Though admitting that the evidence furnished by 13 million bovine udders can't be wrong, scientists of the United States Department of Agriculture are baffled by the seeming nonexistence of cancer in this gland of cattle, especially since cancer is common in the corresponding glands of human beings and various animals. The absence or extreme rarity of cancer in cows' udders is still more surprising, because that organ is unusually large and highly developed functionally. It is also exposed to irritation and bruises.

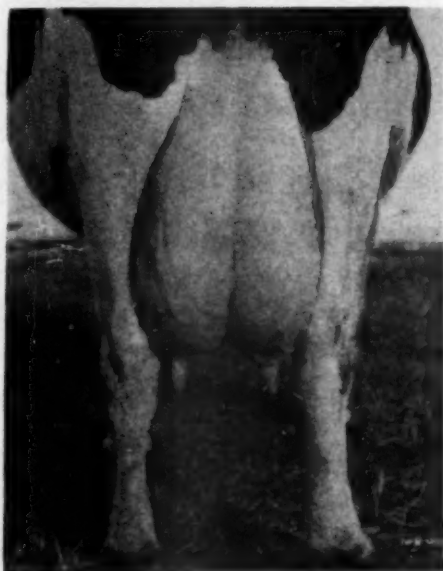
Last year, postmortem examinations by the federal meat inspection service disclosed that 32,709 cattle were affected with some kind of tumor, and laboratory studies showed that many were malignant, but no cases of cancer of the udder were found.—*USDA Research Admin.*, May 29, 1945.

Amigen and Gelatin in Hemorrhagic Shock

A mixture of amigen (an enzymatic amino acid of casein) and bone gelatin from hogs and cattle is a satisfactory substitute for physiological salt solution or blood-plasma transfusions in hemorrhagic shock in dogs. The mixture maintains circulatory volume without the untoward reactions characteristic of red blood cell suspension and heparinized plasma. Details of the experimental work leading to this conclusion may be sought in *Surgery, Gynecology, and Obstetrics* for February, 1945.

To possess maximum value, infusions to restore blood volume must have the physical quality of not slipping away through the capillaries or kidneys.

A coming surgical procedure that will find many uses in veterinary surgery is the use of absorbable packing (sponges). On test, at the present time, are absorbable packings made of fibrin foam from human blood, gelatine, and oxidized gauze or cotton.



—From *Wisconsin Holstein News*
Reproduced as the rear view of a well-balanced udder of a high-producing Holstein-Friesian—Susie Hartog Mercedes DeKol, of the Clyman Farms, Watertown, Wis.

Fracture of the First Rib in Marching Soldiers

"March Fractures of the First Rib", or "Barrack Bags Fracture", the subject of a report by Proctor, Campbell, and Armstrong, Medical Corps, U. S. Army, published in the June issue of the *Bulletin of the U. S. Army Medical Department*, is a reminder of that onetime common accident in work horses. The fracture in marching soldiers occurs under the sudden stress of a pull by the musculature inserted to the cephalic border of the rib, under conditions of fatigue, shifting of bags, and the quick effort to readjust them. They weigh 40 lb. each, and are connected by



—From *Veterinary Surgical Operations*, 1906

Fig. 1—Grocery-wagon horse suddenly disabled after stumbling without falling down. The picture was taken within a few hours after the accident. Note the dropped elbow showing complete paralysis of the triceps brachii.

a rope carried over the shoulder. The rope bounces slightly and the bouncing is increased by the slight kick given to the anterior bag by the knee. Perhaps, what happens in horses may help to explain the precise type of stress that fractures the soldier's first rib. A tired horse pulling a load (not necessarily heavy) stumbles and in recovering suddenly jerks the head upward in the act of recovering its bal-

ance. The powerful cervical muscles snap the rib. The disability of the leg is immediate and complete and owing to the forward displacement of the segments against



—From *Veterinary Surgical Operations*, 1906

Fig. 2—Left first rib of horse shown in figure 1. The left figure shows the approximate angle of the segments at the time of autopsy. The right figure shows the fracture set for the camera.

the brachial plexes, a paralysis of long duration follows.

Fertility of Mares

No significant difference was noted in the fertility of mares bred during foal heats and a similar group bred during nonfoal heats in a stud of purebred Belgians, reported by W. G. Stevenson. There is a common belief among horse breeders that mares are more fertile at foal heats, and an equally common belief among veterinarians that too much infection and debris persists from the previous foaling until the foal heat. Figures show equally good results in mares bred at foal heat and those bred at later periods.—*From Canad. J. Comp. Med.*, May, 1945.

Ascorbic acid has been shown virucidal against vaccinia, encephalomyelitis, and influenza A (*in vitro*). Hydrogen peroxide is liberated in its oxidation.—*Science*, June 8, 1945.

CLINICAL DATA

Clinical Notes

Sodium bicarbonate is the most reliable preventive of renal damage induced by sulfa drugs.

Favorable results obtained from sulfonamide therapy in trichomoniasis vaginalis (human) suggests the making of a more critical test of sulfa drugs in animals.

Except for tying up vitamins in the digestive tract, sulfonamides are not likely to prove highly injurious in veterinary medicine, since organic damage results mainly from long continued use.

Colchicum, favorite galenical of the old physicians, is now known to rate high as a growth stimulant in plant life. Its active principle, colchicine, accelerates cellular metabolism.

In line with the redeployment of troops to the southwest Pacific, greatly increased needs for quinacrine (=atabrine) have caused WPB to place it under more stringent allocation control.

Dicumarol caused uncontrollable bleeding with fatal results in a human patient, described in *Annals of Internal Medicine*. The author warns against the use of this drug in the absence of accurate prothrombin- and coagulation-time determinations.

Lambert and Brandon, California State Department of Agriculture (*Milk Technology*, May-June, 1945), in a series of comparative tests to determine the reliability of the Babcock butterfat test on homogenized milk found that, while the regular Babcock test gave accurate results, neither the Minnesota nor the Pennsylvania modifications could be recommended.

The mushroom enzyme, tyrosinase, is announced as a remedy for ivy poison dermatitis.

Promin, the sulfone preparation undergoing tests for its curative properties in human tuberculosis, is said to be giving important results in the treatment of leprosy.

Persons recently vaccinated against smallpox should not milk cows. They are carriers of cowpox virus, according to Illinois animal pathologists quoted in *Hoard's Dairyman*.

The use of vitamin C for hay fever and other allergic conditions, although never generally approved by the medical profession, has been found "useless and wasteful."—*From the J. Am. M. A.*

Critical tests of penicillin *in vitro* made by Foley, Lee, and Epstein (*Milk Technology*, May-June, 1945) revealed that the usual bovine mastitis organisms are highly susceptible to its action in small amounts.

Biochemists have pointed out that dicumarol, toxic anticoagulant of spoiled sweet clover, being a product of bacterial decomposition and having important antiseptic action, belongs to the antibiotics along with penicillin, tyrothricin, streptomycin, and the others.

On account of its sporicide action, penicillin may replace other agencies in the preservation of food. It may even replace pasteurization of milk and nonpressure canning of fruits and vegetables. Critical tests of penicillin as a food preservative are under way in the Division of Dairy Research, USDA.

Rye Smut (*Secale Cornutum* or Ergot of Rye)

The eminence that some fungi are attaining in the drug field brings to mind the oldest member of that biotic group—the sclerotia (smut) of the fungus *Claviceps purpurea*, which infects the grain of rye and of other cereals and transforms it into the time-honored vasoconstrictor and oxy-



—From *J. Am. Pharm. A.*, January, 1945.
Beards of rye infected with *Claviceps purpurea*, a plant disease that modern farming methods has largely eliminated.

tocic. *C. purpurea* is antibiotic in the sense that it kills its host and forms a medicinal agent in the process. The fungus is famously uniform in its action on grain. Regardless of the grain attacked (rye, wheat, oats, rice), the chemical produced has precisely the same medicinal properties, varying, however, in strength. Ergot of wild rice was used by the Indians of the Northwest as an abortifacient and oxytocic; that of oats is employed in North Africa instead of the ergot of rye. Warburton (1911) reported the presence of ergot in oats grown at Iowa State College. Europe

is the source of the commercial supply. American millers, after taking the pains to remove the morbid grain before milling, throw it away as if unaware that there is a local demand for every ounce.

Because of improved farming methods, toxic accidents from eating ergot (ergotism) have become rare. It has been rarely mentioned in American veterinary literature during the last thirty years. The old veterinarians of the Middlewest described two forms: gangrenous and convulsive, which, on certain occasions, caused heavy losses in cattle.

The drug has never won much favor in veterinary practice due to uncertainty and unreliability of action, obviously explainable by faulty assay. To be active, the dry ergot should contain not less than 0.5 mg. of ergotoxine ethanesulfonate per gram, and the fluid extract 0.06 per cent w/v of that alkaloid. Given *per os*, neither the fluid extract nor the alkaloid are at all comparable to surgical pituitary extract in animal obstetrics. Being quite insoluble in water, the alkaloids are not suitable for hypodermic use.

Owing to the shortage of ergot during the war, botanists are recommending the growing of ergot of rye in this country. Seemingly, ergot has not lost favor in human medicine. Critical tests on dynamics, dosage, methods of administration and precise indication, are lacking in veterinary medicine. The study to be complete should include seven alkaloids of somewhat different actions.

Streptomycin

Streptomycin, product of a soil bacillus, discovered by scientists of the New Jersey Agricultural Experiment Station, has important microbicide action against cultures of *Mycobacterium tuberculosis*, and was found to have a suppressive action against experimental tuberculosis in guinea pigs by Feldman and Hinshaw, of the Mayo Foundation, whose critical work with other anti-tuberculosis agents has been widely published.

Pseudomonas Infection in Turkeys

Early in June, 1944, several 3-week-old poultts were received for examination from a farm where severe losses in the birds were occurring. Superficially, the outbreak resembled and was thought to be pullorum disease. Culturally, however, a gram-negative, motile, pigment-producing organism was isolated from the blood stream, viscera, and intestinal contents of all birds examined. Study of the organism showed it to be similar if not identical to *Pseudomonas aeruginosa*. The pathogenicity of the organism for chicks was tested by introducing a 24-hour broth culture into the drinking water of 2 dozen newly-hatched birds for two successive days. After an incubation period varying from seven to ten days, all chicks became clinically affected and about half of them died. The test organism was recovered from all of 6 dead birds examined.

The source of the infection in the poultts was not determined. The care, feeding, and management of the birds were excellent. The young poultts were segregated at the time of delivery into lots of 150 each, and maintained continuously upon wire. All of the birds in 2 segregated units were affected while approximately half of them died. Lesser losses occurred in other lots while only 1 unit escaped without loss attributable to this disease. According to the owner, the losses markedly diminished upon substitution of feed. This, however, may have been merely coincidental.

Pseudomonas infection in approximately 19,000 turkeys with a morbidity rate of nearly 50 per cent, accompanied by a very low mortality, has been described by Stafseth, Mack, and Ryff.¹ The same authors refer to occasional reports of *Pseudomonas* infections in chickens.—E. H. Peterson, D.V.M., Department of Animal Pathology and Hygiene, University of Illinois, Urbana.

The author is now at the College of Veterinary Medicine, State College of Washington, Pullman.

¹Stafseth, H. J., Mack, Walter, and Ryff, J. F.: *Pseudomonas* Infection in Turkeys. *Poult. Sci.*, 19, (1940): 126-130.

Bovine serum has been successfully used as a substitute for human plasma. The proteins were protected against coagulation while the antibodies were inactivated by heat.—Brit. M. J.

Preventing and Curing Stiff Lamb Disease

Stiff lamb disease is an ailment of sucking lambs 3 to 5 weeks old. It is nutritional, and Willman reports that vitamin E is the factor involved. In experimental lots, the feeding of vitamin E to ewes at lambing time and afterward avoided the appearance of stiff lambs, while in an adjoining lot on identical ration, except for the vitamin E, 13 of 27 lambs developed the peculiar muscular stiffness. Seven of the stiff lambs were treated with subcutaneous injection of a water-soluble vitamin E, and six recovered promptly while one died. Six stiff lambs were not treated, and only one survived.

Flocks that have previously had trouble may avoid it by feeding ewes 1/4 to 1/3 lb., daily, of unextracted wheat-germ meal, or, when this is not available, liberal amounts of wheat bran or wheat grain may be fed to advantage.—From *California Wool Grower*, May 28, 1945.

Canine Coccidiosis

Clinical coccidiosis is becoming more common among dogs, and it is highly fatal. The affected dog shows champing jaws, frothing, locomotor incoordination, occasionally chorea, and sometimes pustular skin eruptions or mucopurulent conjunctivitis.

Isospora are much more common than *Eimeria*, and the bloody diarrhea in other species is seldom seen because the infection is limited to the small intestine. Treatment with 1 Gm. of sulfanilamide for each 20 lb. of weight per day, divided in two doses, was highly effective in the hands of Mukerji and Das, Calcutta, India (*Indian Vet. J.*, March, 1945).

Erysipelas Resists Sulfonamides

Sulfanilamide, sulfapyridine, and sulfathiazole were used in an attempt to control *Erysipelothrix rhusiopathiae* infection in mice by H. Konst, who concluded that under the conditions of his experiment they had failed and that it would seem unlikely that these drugs will prove of value in the treatment of erysipelas in swine.—From *Canad. J. Comp. Med.*, May, 1945.

Histoplasma Causes Lung Calcification

Positive x-ray pictures of lungs of persons with negative tuberculin tests have been shown to result from calcification which follows activity of *Histoplasma capsulatum*. Histoplasmosis has been known as a rare and always fatal disease, but recent work indicates a form so mild as to be unrecognized and yet quite common.—*Science News Letter*, May 26, 1945.

Viruses: Are They Enzymes or Plastogenes?

Certain particulate substances in cytoplasm which have been called mitochondria and microsomes are now known to be ribonucleoproteins (*Science*, June 15, 1945). They have been studied in terms of the chemical actions which they promote, that is as enzymes. Meanwhile, the geneticist has been studying plasmones and plastogenes and their influence on inheritance. Now both arrive at the conclusion that they are closely related to the viruses: One group says that virus is an outlaw enzyme, the other says it is a plastogene in the wrong place.

Brucella Vaccine in Poll Evil and Fistulous Withers

J. D. Peele (*The Veterinary Record*, May 19, 1945) reports 3 cases of poll evil and fistulous withers in horses cured in remarkably short time from injections of the Ministry's No. 1 Vaccine (*Brucella abortus*). One case of poll evil and 1 of fistulous withers had been treated with setons and blisters without response, whereupon they received 5 cc. of the vaccine at five-day intervals. There were terrific local and systemic reactions from the second doses in each case. When the swellings burst and discharged pus, both animals recovered uneventfully.

The third case (poll evil) was in the initial stage, still without fistulous tracts or discharge. Five days after the first injection, the swelling had receded one half and was almost painless. Again, a tremendous reaction followed the second injection. There was inappetence, temperature of 105 F., stiffness, and edema from

poll to leg. These symptoms gradually subsided and the lesioned poll completely resolved in a week.

Presence of Chrysomya Larvae in Rumen of a Steer

A French quartermaster was experiencing some loss in steers, and I was called in by the officer in charge of purchases and slaughter, for an opinion as to the cause of the deaths. This particular steer was very wild, quite weak, and vicious. Because he was running in a swamp, where catching and examining him alive seemed impractical, the steer was shot. The temperature taken immediately after death was 103 F.

On postmortem examination, thousands of fly larvae 1/8 to 1/2 in. in length were found in the rumen and reticulum. These larvae were tentatively identified by Lt. (j.g.) C. G. Fredine entomologist with the Malaria Control Office of the United States Navy, as belonging to the genus *Fannia*. [They were later examined by Mr. McIntosh of the Zoological Division, U.S.B.A.I., and identified as *Chrysomya rufifacies* Macquart. This determination was confirmed by C. T. Greene, U. S. National Museum.]

The larvae appeared to be free living, and had caused no apparent tissue change. No other gross pathology was apparent in the internal organs. There were many stomach flukes present, however. Almost all cattle here have them. The steer had also eaten some mud and sand, a common occurrence in morbid animals.

The steer was heavily infected with ticks, and there were large patches of fly eggs where the ticks had caused the skin to weep. We assumed that the steer had licked the eggs or young larvae off his skin and swallowed them. It is doubtful, in my opinion, that the maggots had any effect on the condition of the steer. His morbid condition was probably due to the very heavy infection of ticks. Nevertheless, I was rather startled at finding this condition *post mortem*.—Captain Rod C. McCornack, V.C., U. S. Army, Foreign Service via San Francisco.

Formula for Flash Burns

"Welder's Drops" is the name given to a wartime formula for flash burns by Dr. K. A. Koerber in the *American Journal of Surgery* (*Glycerine Facts*, May, 1945): The compound is:

Pontocaine	0.25%
Ephedrine sulfate	0.25%
Menthol	0.10%
Glycerine	5.00%
Boric acid sol. q.s.....	100.00%

The mixture is put up into dropper bottles and given to patients for home treatment.

Penicillin by Mouth

The chemical action of the gastric juice on drugs given by the mouth increases the less desirable practice of parenteral administration to such an extent that coating pills with materials that bypass the stomach and start to disintegrate only on reaching the duodenum has long been recognized as a needed improvement in internal medication. Though pills have been coated since the Middle Ages to overcome objectionable taste, and have been sugar-coated for additional improvement since the early part of the nineteenth century, it was not until 1884 that coating to overcome gastric action began, according to the *Journal of the American Pharmaceutical Association*.

The sensitivity of penicillin to stomach acid, and the decided advantage of its use *per os*, again bring the question of enteric coating to the foreground. But, making such a pill is not so simple. Some years back a famous pharmaceutical house gave Dr. E. L. Quitman samples of enteric coated pills to try out on dogs. In due time, when asked if he thought the pills were enteric coated, the Doctor replied, "I'll say they are. They went right on through without getting spoiled." So, it's not surprising that journals of medicine and pharmacy are a bit perturbed over "just the right" coating for penicillin.

To become useful in veterinary practice, administration of penicillin by the mouth seems to be a necessity. Continuous dosing or often repeated dosing is generally impractical in animals, owing to the cost-of-service factor. The dose for animals remains to be worked out. In man, the range is from

40,000 to 300,000 Oxford units per day, and the interval from continuous to every two to four hours. In the face of these facts, its administration internally in outdoor practice must be left to the attendants, who may or may not be able to give enteric coated pills.

Rinderpest

Because of the movement of cattle in connection with military activity in all parts of the world, a short review of the symptoms of this disease appear to be appropriate.

The first evidence of trouble is a rise in temperature, usually occurring three to nine days after exposure and one or two days before the appearance of other symptoms. The temperature continues to rise at the rate of about one degree daily for four or five days.

The first symptoms to appear are depression, with head drooped and resting on any convenient object. There is complete anorexia, no rumination, and marked constipation; but a great thirst. Urine is scanty, respiration rapid, pulse fast; there is a cough but never pneumonia. On the day after these changes are visible, the symptom which is typical of rinderpest appears: a congestion, with petechiation, of all the mucous membranes. It is visible on the conjunctiva, in the nares, on the buccal surface, and in the vagina. Necrotic plaques form, and may be removed with the fingers. As the condition progresses, the constipation changes to a profuse diarrhea with straining, the urine becomes reddish or coffee-colored, and albuminous, and the skin of the udder or scrotum may become necrotic. In the terminal stages the body is dehydrated, shrunken, and emaciated, and the entire body has a fetid odor. Saliva drips from the lips; the animal grinds its teeth constantly, and labors for breath.

Death occurs in from four to eight days, and there is no successful treatment. Rinderpest is caused by a filterable virus, and present indications are that there is only one strain, or at least all cases appear to possess common antigenic properties. Early recognition is important, and it must not be confused with malignant catarrh.—*From Canad. J. Comp. Med., May, 1945.*

Chicken Mite a Vector of Encephalitis

Recent work carried out in the St. Louis area incriminates the chicken mite as a vector of St. Louis encephalitis (*J. Am. M. A.*, June 9, 1945), a virus infection to which chickens and horses are susceptible. The chicken mite belongs to the same order of Arachnida as the tick, *Dermacentor variabilis*, a known transmitter of encephalides viruses. Pools of chicken mites, titrated in tryptose broth, after being kept unfed for thirty days, caused the disease in young Swiss mice as shown by neutralizing tests with specific antisera. The mice showed typical encephalitis. The presumption was that mice in the St. Louis area may well be regarded as accountable for the viral infection in barnyard fowl. Sulkin (*Science*, Apr. 13, 1945) demonstrated that the mite is obviously a permanent reservoir for equine encephalomyelitis from which chickens may infect man and horses. Protecting horses against this infection might greatly reduce the incidence of other virus diseases of man, this author adds.

Resistant Strains of Staphylococci

Strains of staphylococci from human sources (coagulase positive) that are resistant to sulfonamide therapy are being recovered with increasing frequency (*J. Am. M. A.*). This is a permanently acquired characteristic, and is not associated with a diminution of virulence.

Penicillin resistance is also encountered in an occasional strain, and a few strains have been recovered which are resistant to sulfathiazole, sulfadiazine, and penicillin. It has been found that these resistant strains elaborate a substance consistent with, or closely related to, para-aminobenzoic acid.

Favorable results may be secured in dealing with these resistant strains by using sulfonamide and penicillin concurrently, and by increasing the penicillin dosage to 200,000 Oxford units in twenty-four hours.

Phenothiazine is being tested for its tuberculostatic action in human patients.

Mature sows farrow two pigs more per litter than gilts, raise one pig more, and wean litters averaging 50 lb. heavier.

Chemotherapy in Mastitis

Preventive control measures in mastitis can be effective, but require as an adjunct some form of treatment. Roach and Hignett (*Vet. J.*, April, 1945) report that many workers have arrived at varying conclusions, using the same drugs and employing the same techniques, because (1) strains of *Streptococcus agalactiae* vary, (2) the Channel Island breeds respond better than do Holstein-Friesians and Ayrshires, and (3) the skill of attendants and milkers is a big factor.

The Bovine Tuberculosis Situation

For the year ending June 30, 1944, the tuberculin-testing program of the U. S. Bureau of Animal Industry showed three states to be absolutely free from bovine tuberculosis. These were Georgia, Nevada, and the District of Columbia. The rate in Mississippi was 0.01 per cent, Montana 0.02 per cent, Missouri and Tennessee 0.04 per cent, Maine and Florida 0.05 per cent, and Delaware, Idaho, Ohio, Oklahoma, and West Virginia less than 0.1 per cent. The average for the 48 states, Hawaii, and Puerto Rico was 0.21 per cent. The decline in bovine tuberculosis has been accompanied with a marked reduction of human tuberculosis.—*From the Federal Veterinarian.*

Digestion in the Ruminant

In young animals, milk goes directly to the abomasum, but all solid feed is deposited in the anterior portion of the rumen in animals of all ages. The rumen and reticulum form a fermentation chamber in which constant movement is maintained by contraction. Heavy food settles to the reticulum from where it may be regurgitated as cud, pumped over rumen contents, or passed to the omasum. Bacteria present in this fermentation chamber change cellulose to polysaccharide, synthesize protein from urea and other nonprotein nitrogen compounds, produce certain vitamins of the B group, and accomplish 90 per cent of the digestion of dry matter which occurs in the body.—*McAnally and Phillipson in Vet. Rec.*, April 28, 1945.

Guard the Health of Cows—It Pays

The eight-point dairy program for 1945 is carried by the *DeLaval Monthly* for May-June. One of the points, "practice disease control methods" is enlarged upon somewhat by stating that preventive measures require less time, labor, and expense than is usually required to remedy the results of unsanitary conditions and of failure to practice disease control. It pays to guard the health of cows, because healthy cows produce more and better milk.

That the nitrogen washed away from the gutters of dairy barns runs into sizable amount is the theme of an article by R. R. Graves, head of the Division of Dairy Cattle Breeding, USDA.

"Dogs Against the Japs"

An article in *The American Legion Magazine* for June, thus titled, is a sensible story about the dog service of the armed forces in the Pacific theater. "When dogs went to war against the Axis many hardbitten men in the U.S. Service looked on the idea as a freakish brainstorm" is the opening sentence. That's putting it

mildly. Battlefield tactics handed down from the two-fisted riders of the Indian wars were hard to break down. To the old cavalryman, who once held the fate of the nation in his reins, only the hypersentimental nitwit would stoop to advocate the recruitment of dogs for military service. What good is a dog to the galloping troops and unlimbering battery? The old boys were not predicting the crawling, sniping, trench, foxhole, underground type of warfare that calls for an integration of every advantage. The dog is one of those advantages. That fact became evident during the last phases of World War I and



—From *American Legion Magazine*

Fig. 2—On Guadalcanal. Scout recovers from pneumonia, thanks to a timely intravenous injection of dextrose.



—From *American Legion Magazine*

Fig. 1—Andy, a Doberman Pinscher, on duty with the Marine Corps at Bougainville, was cited for merit by the commandant.

was not completely forgotten in the preparation for World War II, when all armies but ours had sizable dog services, and a far-seeing quartermaster general filled the gap by organizing the K-9 Corps, U.S. Army, which has endeared itself to the fighting soldier "for service rendered."

But, let's skip the sentiment and get at the job of preventing the K-9 Corps from being abolished in the organization of the peacetime army. Dogs trained solely for military service are thrice more useful than the casual recruit hurriedly trained,—and the art of training them by army personnel should not be lost. Kennels should be as much a part of the peacetime military setup as the rifle range. The ideal plan would be a permanent K-9 Corps that keeps in touch with civilian dog clubs—the plan pursued to good advantage by the peacetime armies of other countries.

NUTRITION

MATERIAL FURNISHED BY THE COMMITTEE ON NUTRITION

Big Head of Horses in El Salvador

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BIG HEAD, a nutritional disease, was observed in horses in El Salvador, during 1943. Incidences as high as 40 per cent were successfully treated with shark-liver oil. Absence of night blindness under these conditions was noted.

Howell, Hart, and Ittner¹ point out and cite evidence to show that animals fed concentrates and stabled without access to green fodder develop nutritional diseases. Hart and Guilbert² state that many feed essentials are not apt to be present during the dry season in semiarid regions where livestock are kept on the natural vegetation of the range.

The average rainfall for El Salvador is 80 inches. Most of this usually occurs from May to October. The dry months, beginning in November and continuing to May, are almost devoid of rainfall. The occurrence of heavy winds in the first part of the dry season adds to the rapidity of the drying out of pastures and ranges.

These excessively dry conditions in El Salvador are recognized as conducive to deficiency diseases. Thus, the finding of the disease known locally as big head is not surprising. The discovery that the addition of shark-liver oil to the diet reduced the severity of the symptoms and cured certain animals is, however, important. Although this disease was apparently cured by the shark-liver oil, the animals did not suffer from night blindness, a characteristic

symptom of vitamin A deficiency as described by Howell, Hart, and Ittner.¹

Big head, one of the many abnormalities of nutritional origin, has been reported from various parts of the world, and has given rise to some confusion in the literature. Two bone conditions known as osteoporosis and osteofibrosis have been described. In big head it is possible that these occur simultaneously or one precedes the other. Madsen³ describes the disease as osteofibrosis. He states that it is characterized by enlargement and partial replacement of the bones with soft, poorly calcified, fibrous tissues which may also occupy the marrow cavity. The bones of the face and jaws especially become enlarged. The animals are easily fatigued, and may have a snuffling respiration. They often have enlargements of the leg bones and show varying degrees of lameness.

OBSERVATIONS*

Numerous cases of big head were observed by the writer throughout El Salvador. Some breeders had incidences as high as 40 per cent. Big head was observed to occur most frequently in horses that were quartered in stables, fed concentrate rations, and had access to pastures that were dry six months of the year. There was a characteristic syndrome of clinical symptoms in progressive cases of big head leading to the death of the affected horses.

The initial symptoms were slight swelling of the bones of the face and the joints of the legs, and later a general over-all emaciated appearance with an increased en-

El Salvador, Central America, has an area of 13,000 square miles. It is the smallest and most densely populated of all the Central and South American republics.

The author, now with the Inter-American Institute of Agricultural Sciences, is stationed at their field headquarters in Turrialba, Costa Rica. He was working under the direction of the office of the Coördinator of Inter-American Affairs when he conducted the work in El Salvador on big head in horses.

*The writer was recalled to El Salvador from Nov. 16-23, 1944, to observe and study an incidence of big head at the government experiment station. All findings confirmed previous observations and therapy.

enlargement of the bones of the face. The animal's movements were not normal. There was labored respiration and a mucous discharge from the nose, in some cases. The leg joints became increasingly enlarged and the horse moved only with great difficulty. The disease, if not arrested, is fatal.

Case 1.—During the first part of April, 1943, observations were made at the hacienda La Cabaña, Department of Chalatanango. The hacienda has a herd of 75 mares of basic "native" blood, crossed with Thoroughbred and Morgan. The symptoms of big head were observed in 25 of these animals.

The horses had access to pastures which had started to dry out in the latter part of October and were completely dry by the end of February. At no time were the affected horses separated from the unaffected. Cod liver oil had been fed to the

horses throughout the year but was stopped in June, 1942, due to its disappearance from the local market. The following concentrate mix at the rate of 4 to 20 lb. per head per day was fed until February, 1943: corn 1,400 lb.; wheat bran, 550 lb.; rice bran, 560 lb.; rice polishings, 500 lb.; cottonseed meal, 1,120 lb.; cottonseed hulls, 560 lb.; salt, 100 lb. and calcium carbonate, 50 lb. The concentrates to be fed for the day were mixed in molasses, 6 lb. of the ration to 1 lb. of molasses. Once a week 1/2 lb. of linseed meal was added to the ration of each horse. In February, 1943, due to an increase in the number of cases, the cottonseed meal was decreased from 1,120 lb. to 420 lb. The reduction in the protein content of the ration did not retard the progress of big head, nor prevent the development of new cases. On April 8, 1943, in order to determine whether a vitamin A

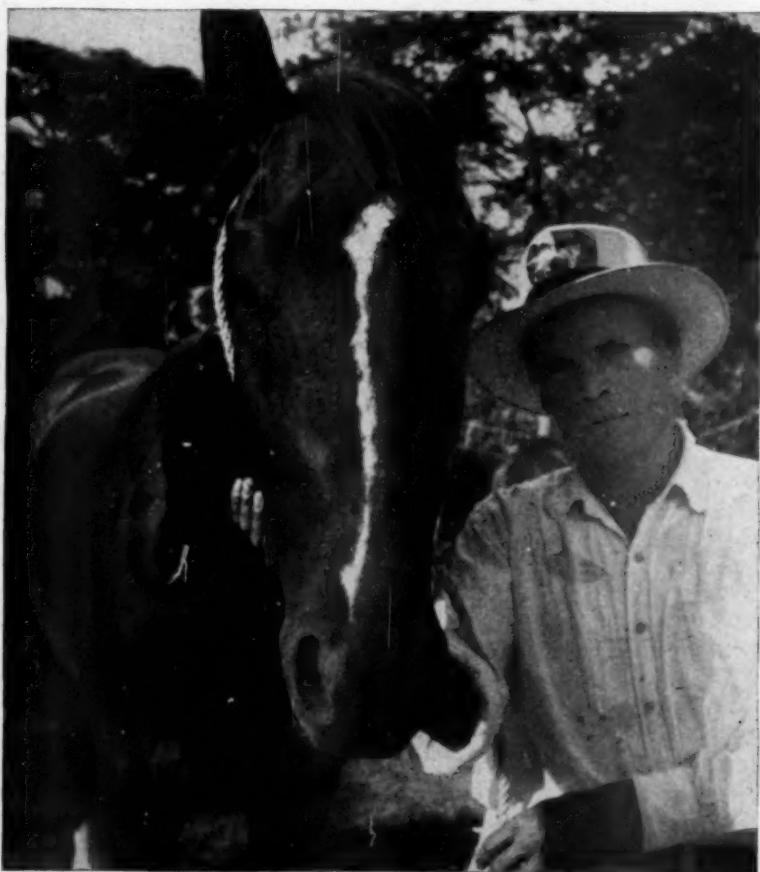


Fig. 1.—Initial case of big head. Thoroughbred stallion, Embajador, of the El Salvador Government Experiment Station.

deficiency existed, the horses were tested for night blindness by the method described by Guilbert, Howell, and Hart,⁴ and were found negative. On the same date, the following ration was prescribed: corn, 58 lb.; cottonseed meal, 15 lb.; rice bran, 10 lb.; wheat bran, 10 lb.; cottonseed hulls, 5 lb.; oyster-shell meal, 1 lb.; bone meal, 1 lb. This ration was fed at the rate of 4 to 20 lb. per head per day, according to the appetite of the animal. Fif-



Fig. 2—Typical enlargement of the facial bones of a Thoroughbred stallion of the El Salvador Government Experiment Station.

teen cc. of a locally extracted shark-liver oil, 1,500 I.U. vitamin A per Gm. by analysis, was poured over the concentrates allotted for each horse per day.

After thirty days on the new ration, with the shark-liver oil added, signs of improvement were noticeable and no new cases developed. At the end of June, 1943, not only were all cases arrested but recession in the swellings of some of the initial cases was noted. The animals which had shown progressive weakness, difficult breathing, rough coats, and stiffness now appeared normal.

Case 2.—The Meza Ayau stables, located in San Salvador, had 4 of 7 horses showing initial to advanced symptoms of big head. The horses of this stable were fed a con-

centrate diet and had no access to pastures. One 6-year-old Thoroughbred stallion developed advanced symptoms of the disease. A slightly labored respiration, general emaciation and swollen leg joints were evident. All four hoofs were badly cracked. The stallion was unable to move save with great difficulty.

On Sept. 12, 1943, 20 cc. of shark-liver oil per day, (1,500 I.U. vitamin A per Gm.) were added to the original diet. On November 15, two months later, the stallion was able to move freely although he still showed signs of weakness. At the end of November he appeared nearly normal. His hoofs, however, were not completely regrown although the cracked condition had disappeared. The progression of the disease was apparently arrested. In October, 1944, the stallion appeared normal although the enlargement of the facial bones was not visibly reduced.

A 3-year-old Palomino mare of the same stable had begun to manifest an enlargement of the facial bones. She was immediately treated with 20 cc. of shark-liver oil per day, added to her original diet, and there was a recession of the enlargement. This mare had never been emaciated nor had swollen leg joints.

Autopsy 1—A 3-Year-Old Filly of the Hacienda La Cabaña Killed in April, 1943.—Before killing the filly, the following advanced symptoms were recorded: The bones of the face and jaws were greatly enlarged. A labored respiration accompanied by a mucous discharge from the nose occurred frequently. The filly was emaciated and her hair was rough and unhealthy. The animal could move only after great effort. At the autopsy, definite bone alteration was found in the skull. Great quantities of mucoïd material were present. An examination of the joints of the legs gave no evidence of bone changes. The viscera and other organs appeared normal.

Autopsies 2 and 3—a Stallion and a Mare Killed June, 1944.—A stallion and a mare, showing the symptoms of advanced cases, were donated to the El Salvador Government Experiment Station by two different horse breeders for study. In the autopsies, the characteristic alterations were found in the skulls. An examination of the joints of the legs of both animals

gave no evidence of bone changes. The viscera and other organs appeared normal.

GENERAL DISCUSSION

It was at first thought that the high protein content of the ration, fed to the horses at the *hacienda* La Cabaña, had disturbed the calcium-phosphorus balance. However, as has been indicated, when the protein content of the ration was lowered, the progress of the disease was not arrested. Hart and Guilbert,² in reference to the diet of cattle, state that: "According to evidence from varied sources, manifestations of single deficiencies are produced more rapidly by the stimulating effects of an otherwise complete ration. The feeding of cottonseed cake, for example, will result in vitamin A deficiency after a shorter period than when growth and production are more severely limited by the

multiple deficiencies of range forage alone". Since the ration fed contained sufficient calcium and phosphorus, the shark-liver oil treatment apparently effected the cure.

Howell, Hart, and Ittner¹ state that horses on a vitamin-A-deficient diet develop night blindness. The 75 mares of the *hacienda*, La Cabaña, tested on April 8, 1943, and 5 horses of the El Salvador Government Experiment Station showing symptoms of the disease, tested on June 10, 1944, were all negative to the night blindness test. Therefore, in big head, if vitamin A deficiency were a causative factor it did not manifest itself as night blindness.

At the Meza Ayau stables, in the case history of the Thoroughbred stallion, the occurrence of cracked hoofs resembled that of a Belgian filly described by Madsen⁴ at the Beltsville Research Center. This filly

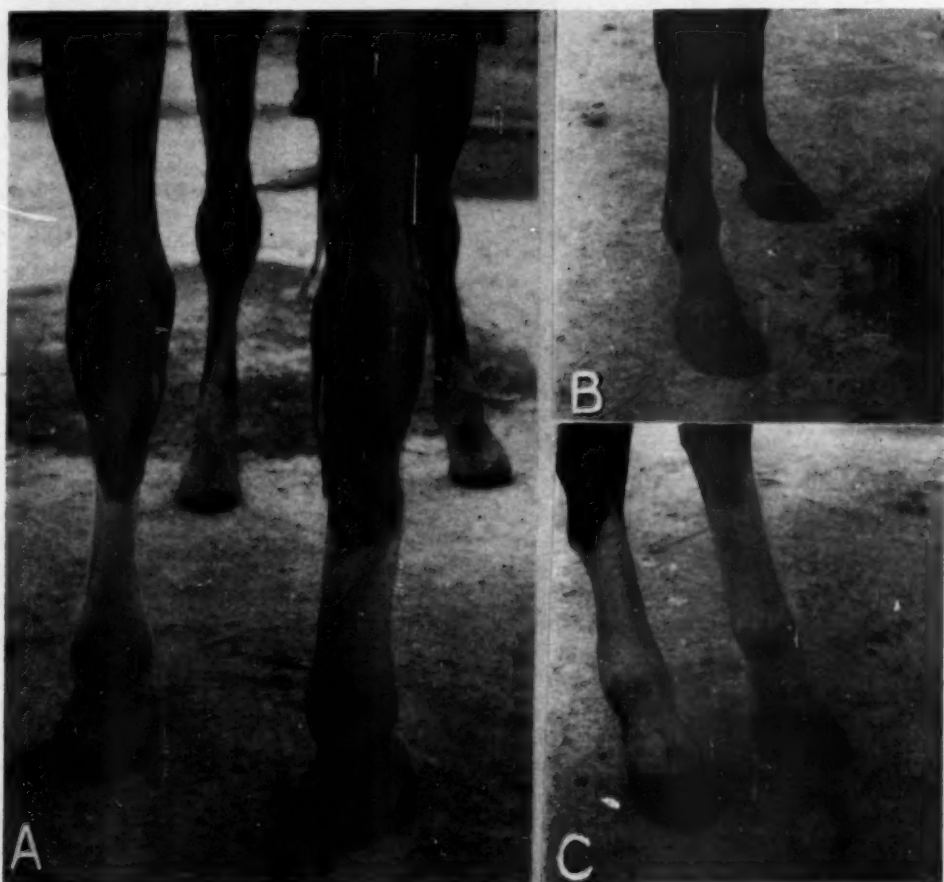


Fig. 3—Thoroughbred stallion of the Meza Ayau stables. (A) Typical enlargement of the leg joints. (B and C) Cracked hoof condition.

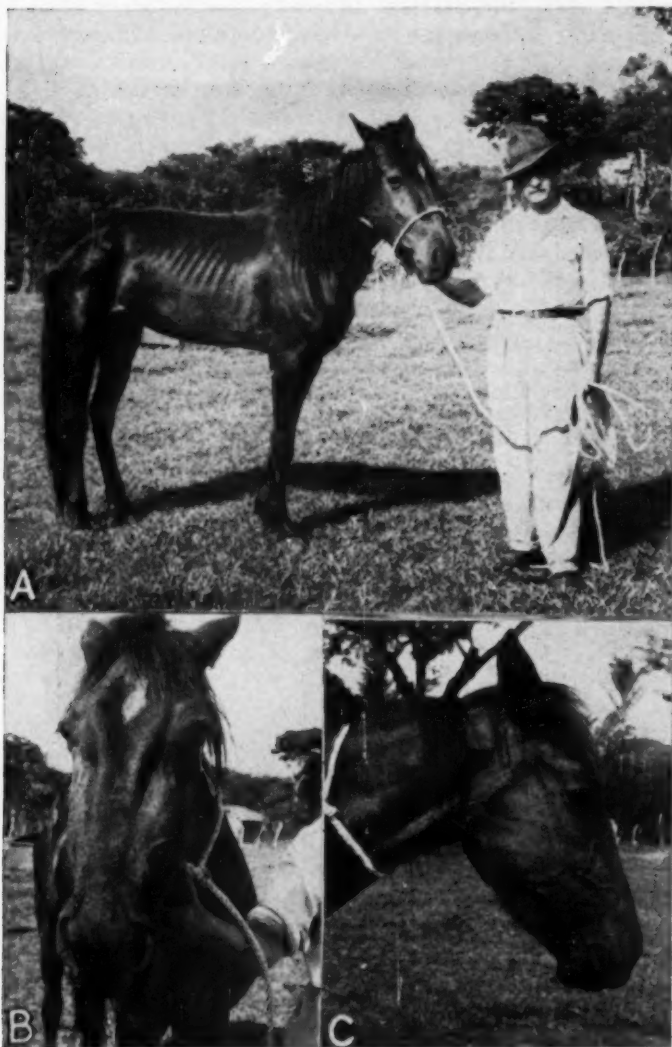


Fig. 4—Autopsy, case 3. Mare killed June, 1944. (A) Typical over-all emaciated condition. (B) Front view showing enlargement of the facial bones. (C) Side view showing enlargement of the facial bones.

was diagnosed as being vitamin A deficient. She had a rough coat, scaly skin, and abnormal hoof growth. Within eleven months after the deficiency was corrected, the defective hoof was completely regrown and the newly formed hoof appeared normal.

The Palomino filly of the same stables manifested the initial symptoms of enlargement of the facial bones. This filly was apparently normal in all other respects. Apparently, the immediate treatment brought about the recession before ossification had taken place.

SUMMARY

Horses with big head in a progressive condition manifested the following symptoms:

A general, over-all emaciated appear-

ance with an enlargement of the bones of the face and jaws. This was accompanied by a labored respiration and a mucous discharge from the nose.

The leg joints became increasingly swollen and the animals moved only with great difficulty.

Cracked hoofs, were observed in a number of the cases.

The horses were cured by shark-liver oil therapy* and appeared perfectly normal.

Recessions of the conditions were noted only in cases that were treated with shark-liver oil at the start of the swelling of the facial bones.

*On the basis of these observations, there is a strong indication that shark-liver oil has a curative effect. It is recognized that a controlled experiment would be necessary to demonstrate definitely the rôle of vitamins A and D in this treatment.

Night blindness, a common symptom of vitamin A deficiency, was not observed in these cases.

[*Comment.*—Intentionally or unintentionally, the author has by-passed the brilliant work of Kintner and Holt, of the Veterinary Corps, on big head in horses in the Philippines (*Philippine J. Sci.*, 49, 1932: 1). These men showed that the condition which had been called osteoporosis or bran disease was indeed due to disturbance of the ratio of calcium to phosphorus in the blood and in the feed—in fact, they coined the phrase “calcium-phosphorus ratio.” They found that a serum calcium increase of 9 per cent and a serum phosphorus decrease of 20 per cent existed in affected horses.

While the author takes cognizance of the calcium-phosphorus balance, he does not mention a determination of serum calcium and phosphorus and he reports only one step taken to correct a possible unbalance—feeding shark-liver oil. He therefore raises the question of an effect of feeding such a vitamin concentrate upon the Ca: P ratio of the blood.—Editor.]

References

- ¹Howell, C. E., Hart, G. H., Ittner, N. R.: Vitamin A Deficiency in Horses. *Am. J. Vet. Res.*, 2, (1941): 60-74.
- ²Hart, F. H., and Guilbert, H. R.: Vitamin A Deficiency as Related to Reproduction in Range Cattle. *Univ. California Bull.* 560, 1933.
- ³Madsen, Louis L.: Nutritional Diseases of Farm Animals. *Year Book of Agriculture*, (1942): 323-353.
- ⁴Guilbert, H. R., Howell, C. E., and Hart, G. H.: Minimum Vitamin A and Carotene Requirements of Mammalian Species. *J. Nutr.*, 19, (1940): 91-103.

Source of Fat in Fatty Livers

Observations indicate that the major site of fatty acid synthesis is the liver, and that in choline deficiency the transport of fatty acids from the liver to the depots is slowed down. When choline and cystine are provided, following the establishment of choline deficiency, fatty acid accumulates in the liver, much of which finds its way to the depots. It is concluded (*Nutr. Rev.*, May, 1945) that fatty liver in that case is due to accelerated fatty acid synthesis and not to a slowing of the transport of fatty acids from the liver to the depots. Following injection with anterior

pituitary extract, fat is transported from the depots and deposited in the liver. It is evident, therefore, that not all fatty livers are produced in the same way.

The Importance of Proteins in Resistance to Infection

All pathogenic microorganisms are foreign proteins, and resistance to them is basically a problem of protein digestion. Foreign proteins activate the antibody mechanisms, and stimulate antimicrobial defense. This stimulation tends to disappear, but the process can be restimulated at a much more rapid rate by the use of “booster” injections, and this is called the anamnestic response. The ability to make such response persists because of the protein matrix within the tissues, this matrix being composed of globulin and being the source of the *gamma* globulins or antibodies. This *gamma* globulin, which we call antibody, is normal serum globulin which has been specifically altered during intracellular synthesis by contact with antigen.

Another antimicrobial defense is the group of cells called phagocytes. The outcome of an invasion by pathogenic microorganisms depends upon the ability of the invaders to multiply and disseminate, or upon the efficiency of the phagocytes which ingest and destroy them. Therefore a continual supply of the reserves and precursors of phagocytes is needed, and these are supplied by the mesenchymal tissue—spleen, bone marrow, lymph nodes, lymphoid tissues, and liver. Undernutrition, malnutrition, and hypoproteinemia interfere with such supply. There exists a direct relationship between the amount of protein consumed and phagocytic activity (in mice).

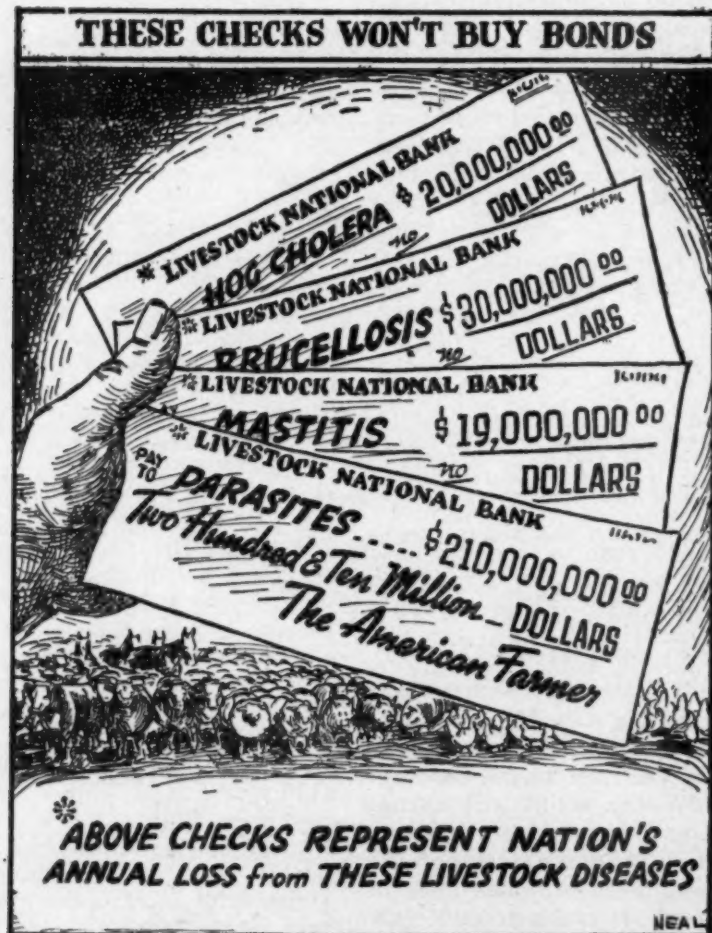
Malnutrition and undernutrition are often terminated with a severe intercurrent infection, undoubtedly because of the failure of the phagocytes to work at peak ability and the failure of the antibody response. Both of these are closely linked with an adequate intake of protein of good quality, that is, containing the essential amino acids in favorable proportions. Human *gamma* globulins contain five of the eight essential amino acids in appreciable quantities, making adequate protein nutrition a basic necessity in maintaining resistance to infection.—*From J. Am. M. A.*, June 2, 1945.

EDITORIAL

Educational Programs and Policies of the "Serum Industry"

Veterinarians, especially of the Middle-west, acknowledge that the member companies of the Associated Serum Producers, Inc., through their steadfast policy of drawing a sharp line of cleavage between professional service and nondescript exploitation, have, for several years, done

yeoman's service in behalf of the veterinary profession, and the country at large, by preventing chaos from breaking down the orderly practice of veterinary medicine. It was this group that cut the pattern for the veterinary-medical program of our time that has stepped closer and closer



—After American Foundation of Animal Health, 1945

Besides the lost food poundage these figures express, they also distinguish between poverty and prosperity in farming. Multiply them by ten to show what American farmers pay every decade for diseases of their livestock. Whether the United States can remain a strong power if these losses are not reduced is a question for all citizens to ponder.

to the hearts of the people, to the mutual advantage of the livestock industry and of all segments of our branch of medicine.

Sanctifying the term "graduate only", and pursuing the policy the term implies, distinguished the objectives of a learned profession from the purely mercenary motive of the producer who cares neither for the profession, the farmer, nor the country. The Associated Serum Producers, Inc. is composed of the following firms engaged in the production of hog-cholera antiserum and virus, other biological preparations, and sundry pharmaceutical products:

Allied Laboratories, Inc., Kansas City, Mo.; Blue Cross Serum Co., Superior, Nebr.; Corn Belt Laboratories, Inc., East St. Louis, Ill.; Fort Dodge Laboratories, Inc., Fort Dodge, Iowa; Grain Belt Supply Co., South Omaha, Nebr.; Jensen-Salsbery Laboratories, Inc., Kansas City, Mo.; Liberty Laboratories, Omaha, Nebr.; Missouri Valley Serum Co., Kansas City, Kans.; Norden Laboratories, Lincoln, Nebr.; Pitman-Moore Co., Indianapolis, Ind.; Sioux City Serum Co., Sioux City, Iowa; Sioux Falls Serum Co., Sioux Falls, So. Dak.; The Columbus Serum Co., Columbus, Ohio; The Corn States Serum Co., Omaha, Nebr.; The Gregory Laboratory, White Hall, Ill.; The National Laboratories Corp., Kansas City, Kans.; The Royal Serum Co., Kansas City, Kans.; The Southwestern Serum Co., Wichita, Kans.; and The United Serum Co., Kansas City, Kans.

To carry out the group's dominant ideology, it was felt that the livestock industry, its industrial ramifications, and the people at large must understand "What the Veterinary Profession Means to Mankind." That is, the story of the aims of veterinary science and the wisdom of employing the college type of practitioners to apply its teachings must be told. For this purpose there was formed the American Foundation for Animal Health which tells in plain language the objectivity of veterinary medicine in the modern world. As an instrument to that end, the Foundation announces that a nation-wide educational program has been inaugurated in leading farm magazines, newspapers, and radio stations in what is believed to be the most far-reaching effort ever attempted to promote good will for, and appreciation of, the value of veterinary services. Highlights of the program will include 22 leading farm magazines, reaching 3,750,000 farm families every month; over 1,000 daily newspapers in all principal cities;

over 1,200 weekly newspapers covering small town and rural readers; and nearly 500 radio stations covering every state.

The newspaper campaign will comprise several interesting features. One, a series of cartoons, will call attention to livestock and human health matters, and the rôle of the veterinary profession in these fields. Another will be a series of livestock health articles, with appropriate illustrations, dealing with important livestock-disease problems and the value of veterinary service in coping with such problems. The service also will include timely news.

Summed up, the campaign under way is planned to make the owners of animals conscious of today's animal-disease problems and to encourage greater use of modern methods of control through the employment of veterinary college graduates who comprise the accredited personnel of the veterinary profession. Were all the producers and distributors of veterinary supplies of the same mind, the veterinary profession would be better and the country richer, as a glance at the accompanying illustration seems to prove.

Saskatchewan Takes a Step

The *Canadian Journal of Comparative Medicine and Veterinary Science* for April publishes, without comment, the transcript of an act before the Legislative Assembly of Saskatchewan, which is intended to provide public subsidy for veterinary service in rural areas beyond the reach of self-supporting private practice. In effect, the act authorizes rural municipalities, or groups of them, to establish "veterinary service districts" which will render financial aid to veterinary practitioners located, or to locate, therein (and we quote), "to prevent the spread of diseases among horses, bulls, cows, hogs, oxen, sheep, and poultry through imparting information and instruction and such other means as may be found necessary; and to perform such other duties as may from time to time be assigned to the board by the minister or lieutenant governor." The municipality or district is authorized to appropriate funds for the purpose, the Province to match the amount appropriated up to \$1,000 annually. To encourage a veterinarian to locate in one of these districts, provisions are made

to compensate him up to \$2,000 a year, granted that he will comply with the regulations set forth.

Whether the act is passed and operated is less important to the world's veterinary profession than the fact that the step represents veterinary history in the making—obviously, forecasting the veterinary service of the future. A food-conscious world is bent upon protecting the main source of its dietary, whatever the proponents of "rugged individualism" may call such movements. Veterinarians must concede that theirs is a public service or suffer the consequence. Subsidy for guardianship of the food supply is in the air and can't be stopped by giving it the wrong name. "That which we call a rose by any other name would smell as sweet," so, however named, saving property and food for the state through expanding veterinary service to every nook will not change its fragrance. The Saskatchewan association is entitled to praise for the foresight of its members.

Interest in Veterinary Science Worldwide

The war has aroused a great deal of interest in veterinary medicine. Journals of science, agriculture, politics, and veterinary medicine indicate that the profession charged with looking after the health of livestock is being brought from limbo to limelight in high places for the first time in modern history. The other day (April, 1945) the House of Lords of Great Britain devoted four and a half hours earnestly discussing a "Motion on Milk and Diseases of Dairy Cattle," which deserves more than casual attention. All of the 18 peers asked to speak on the motion, but owing to the shortness of time (4 1/2 hr.), only 12 could be heard. In commenting on his version of the changing attitude before the House, Lord Bledisloe who made the motion confirmed the implication of our headline as follows:

My Lords, for thirty years I have been taking part in the agricultural debates in the two Houses of Parliament and I cannot remember any debate in which so many interesting, useful, and suggestive speeches have been made.

The weight of these few words is incommensurate in the councils of the veterinary

profession, not only of Great Britain but of all the civilized nations now charged with launching an era of peace. [See more details on p. 67.]

National Dog Week

National Dog Week, Sept. 16-22, 1945, will be backed this year by 12 million dog owners. It is dedicated to kindness and a better world for dogs and all other animals.

Dr. James Farquharson, president of the AVMA, has accepted membership on the advisory committee to succeed Dr. Charles W. Bower. Other members of the 1945 advisory committee, all of whom served last year, include Dr. James E. West, chief scout, Boy Scouts of America; Harry I. Caesar, president, Dogs for Defense, Inc.; Dale Carnegie, psychologist and author; Sydney H. Coleman, president, American Humane Association; Dr. W. A. Young, managing director, The Anti-Cruelty Society of Chicago; Bob Becker, editor *Outdoorsman* and outdoors editor, *Chicago Tribune*; Peter Boggs, McNaught syndicate dog columnist; and George Butz, kennel editor, *Philadelphia Inquirer*. National Dog Week has a seven point objective:

- A good home for every dog.
- Eliminate stray dogs from the streets.
- Better informed dog owners.
- Teach consideration for dogs and all animals.
- Emphasize the dog's use as companion, helper, and home protector.
- Secure fair laws for dogs and their owners.
- Teach respect for rights of non-dog owners.

In the 1840's, there were less than 50 veterinarians in the United States. The federal census of 1850 gives the number as 46 of whom nearly half were in New York State. During the 1850 decade, the number increased to 392, or an increase of 752.1 per cent. In the 1880's, the increase was 205 per cent, i.e., from 2,130 to 6,494. Since then, the percentage of increase has been downward *vis a vis* the tremendous increase in the value and number of livestock.

Hogs fed on dry feed show a higher dressing percentage than those fed slop.

"How Many Is Too Many"

The interest aroused by the editorial, "How Many Is Too Many," in the March issue is promising. Slowly, American veterinarians are beginning to admit that a vast amount of "veterinary work" has never been done at all and that much that is done has gone out of the hands of the veterinary profession, through the failure to supply the people with the over-all scientific service they have needed to police the mounting value, number, and importance of the livestock population. The very fact that we have argued and still argue over the number of veterinarians the United States should have, has had a murderous effect on the veterinary profession—a veritable hara-kiri—traceable to our intramural disagreement (or should one say ignorance?) over this basic issue. Can you imagine a more deadly effect on the progress of veterinary science in this country than our constant preachings about the number of veterinarians in the face of the contemporary livestock situation? Is there any wonder that the states hesitated so long to establish and give competent support to veterinary colleges, while the profession was preaching that no more veterinarians were needed? We were taken at our word, and others stepped in from necessity. Better take time out and do some analyzing. Formal veterinary education and the United States are about the same age. In the 1840's (1845), for example, there were 1,000 college-made veterinarians in nonagricultural Great Britain and 2,027 in agricultural France. (We'll skip the other countries for lack of data.) In the United States, according to the Bureau of Census, in 1850 there was a total of 46 veterinarians of whom nearly half were in New York State. Remember this country was discovered in 1492. During the War between the States (the 1860's), there were about 400 (392 according to the census of 1860). By 1880, the number had risen to 2,130, by 1890, the number was 6,494, and by the end of the century 8,163. In the fields of practice, education, and association work, during the last two decades of this period, the bawling about overcrowding was loud and constant, and just as today, those who pointed out the whirlwind increase of the human

and animal populations and the need of expanding veterinary service correspondingly, preached to the deaf. The 8,163 college-made veterinarians of 1900 were nearly all practitioners. There are not many more than that today, or nearly half a century later, though the human and livestock populations have doubled. Seems to be a case of hypermyopic astigmatism. In the 1890's, nothing much mattered but the drenching bottle and firing iron. In 1945, all hinges on the glassware of the laboratory. Meanwhile, all sorts of technicians have had to step in to do work that knowledge maps out and the people want done. As a matter of fact, the development of new fields for the veterinary art was never a major project of the veterinary profession—like the study of how many are needed in the *status quo*. Or should one emphasize that "How Many is too Many" can never be answered categorically until the tasks for which veterinary colleges graduate men are fully developed and given into their hands.

What we are trying to say is that expansion of the veterinary service, and providing college-made men to fill the jobs created by the expansion, is no less important than it was a hundred years ago when 46 men, mostly of New York and Boston, thought they had everything under control.

Veterinary Education in India

Veterinary service is a force like a battalion of guards, safeguarding the health of the Indian peasant. It secures the foundations of agriculture against chance upheavals. Veterinary education has been the Cinderella of government education departments in India. The veterinarian does not merely relieve the sufferings of dumb servitors but he helps materially to conserve the vast wealth of the nation, invested in its fields, flocks, and herds, says C. J. Fernandes, director of animal husbandry, Mewar State, in the *Indian Veterinary Journal*, January, 1945.

Paper sheets impregnated with lignin and compressed are strong enough to compete with aluminum.

Key Abbreviations for Periodicals

The following abbreviations are compiled for the information of authors writing for the JOURNAL and for the convenience of the editors.

A.—Association	Clinica (Sp.)	Klinische (Ger.)
Aarskr.—Aarskrift (Dan.)	Clinica (It.)	Lab.—Laboratory
Abstr.—Abstract	Clinique (Fr.)	Laryng.—Laryngology
Acad.—Academy	Coll.—College	Leg.—Legal
Académie (Fr.)	Comm.—Commission	M.—Medical
Agric.—Agricultural	Comp.—Comparative	Médicale (Fr.)
Agriculture	Comparée (Fr.)	Médical (Fr.)
Agron.—Agronomy	Compt. rend.—Comptes	Médico (Sp.)
Am.—American	rendus (Fr.)	Maanedsskr.—Maanedsskrift (Dan.)
An.—Annales (Sp.)	Cong.—Congress	Mag.—Magazine
Analg.—Analgesia	Congrès (Fr.)	Med.—Medicine
Anat.—Anatomy	Crón.—Crónica (Sp.)	Méd.—Médecine (Fr.)
Anatomia (Sp.)	Crim.—Criminal	Mém.—Mémoire (Fr.)
Anatomie (Fr.,Ger.)	Dent.—Dental	Mem.—Memoir
Anesth.—Anesthesia	Dept.—Department	Memoria (Sp.)
Anim.—Animal	Dermat.—Dermatology	Ment.—Mental
Ann.—Annual	Diag.—Diagnosis (Eng.,Sp.)	Metab.—Metabolism
Annals	Diagnosi (It.)	Metabolic
Annales (Fr.)	Diagnose (Ger.,Fr.)	Mex.—Mexican
Annali (It.)	Diergeneesk.—Diergeneeskunde (D.)	Milit.—Military
Annalen (Ger.)	Dig.—Digest	Militaire (Fr.)
Anst.—Anstalt (Scand.)	Digest.—Digestive	Min.—Ministry
Anthropol.—Anthropology	Direct.—Director	Mitt.—Mitteilungen (Ger.)
Anthropologie (Ger.,Fr.)	Dis.—Disease	Mod.—Modern
Antropol.—Antropologia (Sp.)	Div.—Division	Monatschr.—Monatsschrift (Ger.)
Arb.—Arbeiten (Ger.)	Drug.—Druggist	Morphol.—Morphology
Arch.—Archives (Eng.,Fr.)	Dryl.—Drylaeger (Dan.)	Münch.—Münchener (Ger.)
Archiv (Ger.)	Ecol.—Ecology	Nat.—National
Archivos (Sp.)	Educ.—Education	Nederl.—Nederlandsch (D.)
Argent.—Argentinos (Sp.)	Engin.—Engineer	Nerv.—Nervous
Arhiv.—Arhiva (Jugoslav)	Epizoöt.—Epizoötie	Neurol.—Neurology
Arq.—Arquivos (Port.)	Épizoöt.—Épizoötie (Fr.)	Neurologisches (Ger.)
Asoc.—Asociación (Sp.)	Estad.—Estadística (Sp.)	Nord.—Nordisk (Scand.)
Bact.—Bacteriology	Exot.—Exotique (Fr.)	Nutr.—Nutrition
Bakt.—Bakteriologie (Ger.)	Exper.—Experiment	Obst.—Obstetrics
Bakteriologiska (Scand.)	Exptl.—Experimental	Obstétrique (Fr.)
Beitr.—Beiträge (Ger.)	Förh.—Förhandlingar (Scand.)	Obstetricia (Sp.)
Ber.—Berichte (Ger.)	Gastroenterol.—Gastroenterology	Off.—Office (Fr.)
Berät.—Berättelse (Scand.)	Gaz.—Gazette (Eng.,Fr.)	Ophth.—Ophthalmology
Berl.—Berliner (Ger.)	Gazeta (Sp.)	Organ.—Organization
Bibliog.—Bibliography	Gazz.—Gazzetta (It.)	Otol.—Otology
Bibliographie (Ger.,Fr.)	Gen.—General	Parasitol.—Parasitology
Bibliot.—Bibliotek (Dan.)	Gén.—Générale (Fr.)	Pat.—Patologia (It.)
Bienn.—Biennial	Geneesk.—Geneeskunde (D.)	Path.—Pathology
Biochem.—Biochemical	Ginec.—Ginecologia (It.)	Pathologie (Fr.,Ger.)
Biochemische (Ger.)	Gior.—Giornale (It.)	Pediat.—Pediatrics
Biochim.—Biochimica (It.)	Gynec.—Gynecology	Pediatrica (Sp.)
Biochimie (Fr.)	Helminthol.—Helminthology	Pharm.—Pharmacy
Biog.—Biography	Hered.—Heredité	Pharmaceutical
Biol.—Biology	Hist.—History	Pharmacol.—Pharmacology
Biological	Histoire (Fr.)	Phys.—Physical
Biologie (Ger.,Fr.,It.)	Hôp.—Hôpital (Fr.)	Physiol.—Physiology
Blad.—Bladen (D.)	Hosp.—Hospital	Poult.—Poultry
Bol.—Boletín (Sp.)	Husb.—Husbandry	Prac.—Practice
Boll.—Bollettino (It.)	Hyg.—Hygiene	Practical
Brit.—British	Hygiène (Fr.)	Prakt.—Praktik (Ger.)
Bul.—Buletinul (Rum.)	Immunol.—Immunology	Prat.—Pratique (Fr.)
Bull.—Bulletin	Imp.—Imperial	Pratica (It.)
Bulletin (Fr.)	Indust.—Industrial	Proc.—Proceedings
Canad.—Canadian	Industry	Prod.—Product
Cent.—Central	Infect.—Infectious	Production
Centrale (Fr.)	Inst.—Institute	Pub.—Public
Centralb.—Centralblatt (Ger.)	Institut (Fr.)	Psychiatr.—Psychiatric
Chem.—Chemical	Instituto (Russ.)	Quart.—Quarterly
Chemistry	Int.—Internal	Radiog.—Radiography
Chim.—Chimie (Fr.)	Internat.—International	Radiol.—Radiology
Chimique (Fr.)	J.—Journal	Radiologie (Fr.)
Chimica (It.)	Jahrb.—Jahrbuch (Ger.)	Rap.—Rapport (Fr.)
Chir.—Chirurgie (Fr.)	Jahresb.—Jahresbericht (Ger.)	Read.—Reader
Chirurgia (It.)	Jap.—Japanese	Reader's
Chron.—Chronie	Kgl.—Kongelige (Dan.)	Rec.—Record
Chronique (Fr.)	Klin.—Klinicheskaya (Rus.)	Recuell (Fr.)
Cir.—Cirugía (Sp.)		Rep.—Report
Circ.—Circular		
Clin.—Clinic		
Clinical		

*Do not use for natural or nature.

Res.—Research
 Rev.—Review
 Revue (Fr.)
 Revista (Sp.)
 Riv.—Rivista (It.)
 Roentg.—Roentgen
 Roentgenology
 Roentgenography
 Roy.—Royal
 Scand.—Scandinavian
 Schweiz.—Schweizer
 (Swiss)
 Sci.—Science
 Scient.—Scientific
 Serv.—Service
 Slav.—Slave (Pol.)
 Soc.—Society
 Société (Fr.)
 Sociedad (Sp.)
 Società (It.)

Statist.—Statistics
 Statistical
 Surg.—Surgery
 Tech.—Technique (Eng.,
 Fr.)
 Technology
 Therap.—Therapy
 Therapeutics
 Therapie (Fr.,Ger.)
 Therapie (It.)
 Tierärztl.—Tierärztliche
 (Ger.)
 Tierheilk.—Tierheilkunde
 (Ger.)
 Tr.—Transaction
 Trav.—Travaux (Fr.)
 Travail (Fr.)
 Trop.—Tropical
 Tuberc.—Tuberculosis
 Univ.—University
 Urol.—Urology

Ven.—Venereal
 Vet.—Veterinary
 Veterinarian
 Vet.—Vétérinaire (Fr.)
 Veterinark.—Veterinar-
 kunde (Ger.)
 Vojen.—Vojenské (Czech.)
 Wehnschr.—Wochenschrift
 (Ger.)
 Wein.—Weiner (Ger.)
 West.—Western
 Wissensch.—Wissenschaft-
 liche (Ger.)
 Zahnärztl.—Zahnärztliche
 (Ger.)
 Ztschr.—Zeitschrift (Ger.)

*Although V. is used for
 the Journal (J.A.V.M.A.),
 Vet. is preferable for general
 use.

Events of the South Pacific Increase Interest in Chinese Theater



—Signal Corps, U. S. Army Photo

This is Capt. Sanders A. Sacks, V.C., A.U.S. (right), who has been on duty in the Y-Force, China Theater, as a liaison officer with a Chinese division. Native of Pennsylvania, the Captain entered the Army in 1942 while in private practice at Montisuma, Ga. He arrived in India the same year and flew over the Himalayas to China in August, 1943, to join the Y-Force. Says the official report received with the picture: "Sacks was sent to a Y-Force training center, where for several months he trained Chinese veterinarians and horseshoers in American methods of caring for animals. In the May offensive to drive the Japs from Tunnan to reopen the Burma road, each attacking unit was supplied with doctors, veterinarians, engineers, and other technicians as well as specialists to advise the Chinese commanders. Sacks crossed the Salween as a member of one of these teams. Because of the nature of the terrain, veterinarians were of extreme importance. The first offensive was fought at an altitude of 12,000 feet in an area seldom visited by white men. All supplies had to be transported either by coolies, tiny pack horses, or slow pack oxen over steep, roadless mountains. Because pack animals were not abundant, it was extremely important to preserve them." Sacks' service won him a bronze star on his Asiatic service ribbon. The Captain's family—wife and daughter—live in Philadelphia. He is a member of the AVMA.

CURRENT LITERATURE

ABSTRACTS

Parasitology in the U.S.S.R.

That Russia has succeeded in its aims to prevent death losses of its population behind the lines as well as in the front lines of military operations is seen in the work of its Academy of Sciences on parasitology in the most remote parts of the country which are apt to suffer from malnutrition and diseases caused by animal parasites. Up to the twentieth century little scientific information had been made available for guarding against insect pests and worm parasites. Following the Revolution of 1917, Russian scientists set out to make clinical parasitology* an important branch of study to the end that its Academy of Sciences became a prolific source of information for parasitologists in all parts of the world. Great epidemics of typhus had overtaken the country to such an extent that Lenin decreed: "Socialism must defeat the louse or the louse will defeat socialism." Shifting populations are obstacles to the mastery of infections as was shown in the outbreaks of amebic dysentery during the Chicago World's Fair (1933). Among the fatal mistakes of Adolph Hitler was the underestimating of Soviet brains in science and technology through which important infectious diseases in the Crimea and the Ukraine had been mastered. The list of these researches since World War I is an endless one of intriguing instances of the human benefits derived. The exigencies of World War II have once again stimulated the brains of Soviet parasitologists to greater accomplishments which have had repercussions in other countries.—[Charles L. Rubenstein, M.D., *San Francisco: Parasitology in the U.S.S.R. M. Times*, 73, (Jan. 1945): 7-9.]

Our Plant and Animal Stocks: Shall We Lose or Keep Them

Geneticists can multiply hereditary variations but they cannot control the direction of events. Perhaps, the future will tell the secret of how the changes in the hereditary substratum of organisms can be mastered. Variation leads; the breeder follows (Bateson).

*Before the Illinois State Veterinary Medical (1927), Maurice G. Hall remarked that the best information on parasitology was coming out of Russia.

The law of producing new combinations rests in the raw materials provided by nature—materials that will aid the geneticist and biologist to analyze development and evolution. Students of human and veterinary medicine seek to control disease; breeders of livestock and plants attempt to improve disease resistance, vigor, yields, and esthetic values. In both plants and animals, the industries desire improvements in quality. The geneticist aims to accomplish that by enhancing hereditary constitution. As the craftsman treasures his tools so does the geneticist treasure the mutations he isolates and describes. With these tools he reshuffles the design of organisms without the advantage of him who has but to invent tools and machines or synthesize new chemical compounds. On the contrary, the geneticist after much research, labor, and expense, finds that his building material—the mutant—has become extinct and thereafter is sought in vain. Moreover, the geneticist has to turn over the result of his work to the breeder of plants or animals who is interested in the particular form created. He cannot perpetuate stocks that are not used.

The development of hybrid corn is probably the geneticist's greatest achievement for agriculture, but it involves the maintenance of many stocks which alone would be of little value. They are preserved because it pays to do so. The large size of the ear, self- and cross-fertilization, the number of mutants, and the relatively simple cytology, make up a unique combination. Of this practical application of genetics to agriculture, Henry A. Wallace remarked that "Humanity will take as great an interest in the creation of superior forms of life as it has taken in past years in the perfection of superior forms of machinery." In other plants and in animals, however, the application of genetics is more complex, though not of less interest to society. Creating accuracy and reliability for the work of the physiologist, pharmacologist, and experimental pathologist, by providing genetic uniformity, is the province of genetics in the world of today. It is the duty of geneticists to provide the proper stocks for this uniformity and to maintain the mutants and variants which have been produced, because their future value can not now be foreseen. New kinds and varie-

ties of plants will be in demand, and no agency now exists which will preserve the mutants of the present from which the new variants can be produced.—[Walter Landauer, *University of Connecticut: Shall We Lose or Keep Our Plant and Animal Stocks. Science, 101, (May 18, 1945): 497-499.*]

Pullorum Disease in Turkeys—Tube-Test Preferred

The tube test, using the dilution of 1:25, was more satisfactory than other tests in the diagnosis of pullorum disease in turkeys; dilution of 1:50 was second choice. The rapid serum test, though not as selective as it should be, was more satisfactory than the whole blood stained-antigen test, and birds giving even a slow and slight reaction to it should be removed. The two-minute incubation test is not long enough for turkeys. Of the 187 birds used, 140 were reactors and *Salmonella pullorum* was isolated from 76 (54%) of them.—[L. D. Bushnell, *Department of Bacteriology, Kansas State Experiment Station: Pullorum Testing of Turkeys, Poultry Sci., 24, (May, 1945): 208-11.*]

BOOKS AND REPORTS

Annual Review of Biochemistry

Biochemistry, onetime unknown or vague segment of a medical education, has become an outstanding "must do" of the study of medicine—as fundamentally outstanding as anatomy and physiology. Biochemistry is the study we vaguely knew as physiological chemistry, a fringe of the course. One speaks of "vague" and "outstanding" because of its hidden secrets on the one hand, and its acknowledged importance to doctors of medicine on the other. The word defines itself, and the achievements of medical science in recent years blaze the trail medical practice must hereafter pursue.

It is, therefore, not difficult to write enthusiastically about a book summing up the known facts on so important a subject, notwithstanding that it arrived for review somewhat late. Too much has "flowed over the dam" since 1940, the date of publication, to attempt a comprehensive criticism, even were one competent to do so. Comparing "what was" as set down in this book with "what is" as of 1945 is too big a task for this modest column to undertake, and nothing less would rate as a fair treatment of this documentation. Yet, in reading through the chapters on hormones, vitamins, soil microbiology, penicillin, and viruses, for examples, one is struck with the fact that the past five years were more famous for practical application than actual scientific discovery. Being written with complete mastery of the subject, the book is, therefore, modern, not

old. Moreover, important scientific data never grow old in the presence of recent concepts yet to be "aged."—[*Annual Review of Biochemistry. By James Murray Luck, Stanford University, Editor, and James H. C. Smith, Carnegie Institution of Washington, Associate Editor. Cloth. 744 pages. Annual Reviews, Inc., Stanford University P. O., California. 1940. Price \$5.00.*]

Los Angeles County Live Stock Department, Annual Report

A welcome annual addition to the veterinarian's library is the carefully edited annual report of the Los Angeles County Live Stock Department—welcome not only for what it contains but, more particularly, for what it reflects on the local veterinary service of a great community having veterinary problems peculiar to itself; veterinary problems encountered in a metropolitan area surrounded by a rich agricultural locality—a district where livestock problems are approached on a disease-control basis. The report for the fiscal year 1943-1944 is a bound booklet of 38 pages with a convenient table of contents and a complete index of cases ranging from cattle, hogs, and poultry through such items as pigeons, rabbits, chinchillas, foxes, guinea pigs, canaries, and even deer.

These activities are carried on by a group of veterinary inspectors under the direction of Dr. L. M. Hurt, county live stock inspector. These men perform postmortem examinations as well as antemortem inspections, and also work along the lines of establishing disease-prevention procedures. They cooperate with the public health officials, and together, this team carries veterinary inspection and service to a point which might well be the envy of any metropolitan group. When one is sorrowing over the slow progress the application of veterinary science is making, along comes this report to prove that the over-all picture has some remarkably brilliant spots. The Los Angeles County veterinary service is such a spot, for here veterinary medicine goes on projecting itself unchecked into every home and every mouth, and into every branch of animal production, despite the tremendous changes brought about in that part of the country by the war. They are "holding the line" against present needs but not unmindful of the coming readjustments, the introduction points out. The report is for the fiscal year ending June 30, 1944. It concerns a livestock production valued at \$80,999,763.50, of which \$41,122,338.50 go to cattle, and \$27,227,300.00 to poultry. Maintaining this large livestock population, mainly by importations of animals and their feed, puts a severe strain on veterinary service. Space

forbids further details of which there are many important ones.—[*Annual Report of the Los Angeles County Live Stock Department for the Year Ending June 30, 1944. Edited by Leslie M. Hurt, D.V.M., B.S. Agric., County Live Stock Inspector. Multigram. Paper bound. 40 pages. Published by the Board of Supervisors. 1945.*]

Modes of Spread of *Streptococcus Agalactiae* Infection in Dairy Herds

Streptococcus agalactiae was isolated from the milk of cows not clinically affected with mastitis, and it was noted that a high rate of infection in a herd may be associated with a low incidence of the clinical disease. A total of 16,482 milk examinations were made, of which 6,406 (38.8%) yielded *Str. agalactiae*. Clinical mastitis was present in 1,284 cases (7.8%). However, 31.3 per cent of the cases of clinical mastitis failed to yield this organism, a fact which suggests that staphylococcal mastitis is of greater frequency than was formerly supposed.

The picture emerging from this investigation is disturbing, because the results of tests on individual cows varied so widely from one weekly test to another, and because, over a period of time, such a high percentage of cows in most herds showed *Str. agalactiae* at some examination of the milk or of teat swabs.

Some cows showed positive milk samples repeatedly without any indication of skin infection, while others showed positive teat swabs consistently without any infection of the milk. In most of the persistent skin infections, abrasions were also found, but a few apparently normal teats with unbroken skin carried large numbers of *Str. agalactiae* on repeated examinations.

Examinations of milkers' hands were made in some herds, and were found to be carrying infection in a high proportion of cases. This was also true of the utensils and objects about the byre which they touched.

In the face of these facts, it is natural that this type of mastitis is a common and recurrent disease in dairy herds and a difficult one to eradicate. Indeed, success is more surprising than failure.

The main reservoir of *Str. agalactiae* is in, or on, the bovine udder. The hands of milkers, and the utensils which they touch, soon free themselves from infection when contact with infected cattle ceases. Segregation or elimination of all cows excreting this organism has in some instances, resulted in successfully controlling mastitis of this type. However, such methods seem too slow, too uncertain, and too costly to offer any reasonable hope of freeing

any large proportion of our dairy herds from *Str. agalactiae* mastitis. It is clear that other factors may be concerned, and that a more adequate knowledge of the pathogenesis of bovine mastitis might reveal other lines along which a successful attack might be made on the disease. Chemotherapy, including synthetic skin disinfectants, offers one alternative.—[The full report is contained in a 25-page booklet published by the Imperial Bureau of Animal Health, New Haw, Weybridge, Surrey, England. Price 3s. 6d.]

The Carotids of the Cat

For studying the history of specialized patterns, the descriptive anatomy of zoölogy must reveal more than the rude, incomplete, and oft-times inaccurate topography that serves well enough for the veterinary curriculum and practice. American literature is not famous for the more transcendent details of domestic animal architecture. One, however, is obligated to point out such exceptions as Foust's dissections of the bovine udder, Chamberlain's atlas of avian osteology and certain latex-injected specimens available to students of veterinary medicine, which this work from the Field Museum of Natural History recalls. The booklet, or paper, as the authors choose to call it, depicts the carotid circulation of *Felis domestica* in color plates, drawings, and descriptive text representing faithful research and painstaking work, including dissections of other carnivores, wild and domestic, to achieve the fulfillment of the zoölogist's purpose, that is, to appreciate and interpret the cat's carotid anatomy. In the reading of this paper, one is impressed, not so much with the difficulty of dissection under the magnification required to trace the finest twig to its destination, but, more particularly, with the present trend to skimp anatomy in the medical and veterinary curriculums in the interest of the so-believed utilitarian medical studies, which, of course, neither zoölogists nor protagonists of basic education sanction. While the trend is to skip the minutiae of anatomy, the good teacher of premedical and pre-veterinary studies is not likely to dodge these details of zoölogy, for mental training should not be so glibly set aside in "doctor making." While that is another theme, this booklet is a reminder that medicine owes a lot to non-medical research.—[*The Carotid Circulation of the Domestic Cat. By D. Dwight Davis, Curator, Anatomy and Osteology, and H. Elizabeth Story, Assistant, Division of Anatomy, Field Museum of Natural History*, Zoological Series, 28, (March 28, 1943). 47 pages. Paper. Illustrated.*]

*Now Chicago Natural History Museum.

THE NEWS

Tentative Program—Executive Board and House of Representatives Palmer House, Chicago—August 20-22, 1945

SUNDAY, AUGUST 19

1:00 p. m.—Board of Governors (Room 11).

MONDAY, AUGUST 20

9:00 a. m.—Board of Governors (Room 11).

2:00 p. m.—Executive Board (Room 11).

6:30 p. m.—Executive Board Dinner (Room 6).

8:00 p. m.—Executive Board (Room 11).
(Evening session if necessary.)

TUESDAY, AUGUST 21

9:00 a. m.—Executive Board (Room 11).

12:30 p. m.—Executive Board Luncheon (Room 6).

1:30 p. m.—House of Representatives—First Session (Crystal Room).

President James Farquharson presiding.

1) Call to order

2) Roll call.

3) Presentation of minutes, 1944 session.

4) President's address.

5) Report of Executive Board—Chairman W. A. Hagan.

6) Proposed amendments to Constitution and By-Laws.

7) Report of Executive Secretary.

8) Report of Treasurer.

8:00 p. m.—House of Representatives—Second Session (Crystal Room). (This night session will be held only if necessary.)

9) Presentation of awards:

Twelfth International Veterinary Congress Prize by W. A. Hagan, chairman of the Executive Board.

Humane Act Award by W. A. Young, chairman, Special Committee.

Borden Award and Medal by James Farquharson, chairman, AVMA Committee on Awards.

10) Report of Executive Board—Chairman W. A. Hagan.

11) Reports of Standing Committees.

Tuesday evening, August 21, may be open for committee meetings if it appears that an evening session of the House is not necessary.

WEDNESDAY, AUGUST 22

9:00 a. m.—House of Representatives—Final Session (Crystal Room).

12) Reports of Special Committees.

13) Reports of Representatives.

14) Unfinished business.

15) New business.

16) Adjournment of House.

2:00 p. m.—Executive Board—final session (Room 11).

Preprints of 1945 reports of committees and representatives have been mailed to delegates or secretaries of constituent associations for study prior to the sessions of the House. Present indications are that about 25 associations will be represented. Members in the Chicago area, who use local transportation facilities only, are invited to attend the sessions of the House.

Women's Auxiliary Business Session, August 21

The Executive Board (all officers and past presidents) of the Women's Auxiliary to the AVMA will hold a meeting in Room 7, Palmer House, Chicago, on Tuesday afternoon, August 21, 1945, for the transaction of such business as may require attention.

Since the AVMA is also holding only a business session this year, there will be no social events of any kind. Auxiliary members in the Chicago area, who use local transportation facilities only, are cordially invited to attend the Board meeting.

s/(Mrs. C. L.) ROSE MILLER, *Secretary-Treasurer*.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative By-Laws—Article X, Section 2.

First Listing

BAKER, CLIFFORD W.
Sanford, Fla.
D.V.M., University of Georgia, 1923.
Vouchers: T. H. Applewhite and J. H. Yoder.

BROWNE, RUPERT R.
U. S. Inspector's Office, c/o Swift & Co., South San Francisco, Calif.
D.V.M., University of the Philippines, 1932.
Vouchers: L. Bilikam and M. A. Northrup.

FAILING, CHARLES H.
Chicago Q.M. Depot, 1819 W. Pershing Road, Chicago, Ill.
D.V.M., Michigan State College, 1937.
Vouchers: J. K. Perry and J. G. Hardenbergh.

GORET, PIERRE
153 Avenue de Neuilly, Neuilly-sur-Seine (Seine), France.
D.M.V., Ecole Veterinaire d'Alfort, 1930.
Vouchers: F. A. Todd and L. A. Merillat.

LIGHTBODY, HUGH M.
5424 S. Cornell Ave., Chicago 15, Ill.
D.V.M., Iowa State College, 1939.
Vouchers: J. H. Perry and W. G. Venzke.

MCARTHUR, FRANCIS X.
Coupeville, Wash.
D.V.M., State College of Washington, 1944.
Vouchers: R. Bradbury and E. C. McCulloch.

SIMONNET, HENRI
Rue de la Cite, Universitaire No. 9, Paris, France.
D.M.V., Ecole Nationale Veterinaire d'Alfort, 1913.
Vouchers: F. A. Todd and L. A. Merillat.

Second Listing

Cameron, W. B., 2425 Bloor St. W., Toronto, Ont., Can.

Christensen, Nels F., E. 21st St., Cedar Falls, Iowa.

Gitzen, George N., 129 N. Grape St., Medford, Ore.

Ludloff, O. W., 1321 Palolo Ave., Honolulu 47, T. H.

Moser, Samuel H., Mohrsville, Pa.

Nye, I. B., 103 Livestock Exchange, Fort Worth 6, Texas.

Phillips, Percy E., 92 Maple St., Winchendon, Mass.

Sawyer, R. A., 817—8th Ave., Brookings, S. Dak.

Turman, Paul M., P. O. Box 1016, Tyler, Texas.

1945 Graduate Applicants First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Michigan State College

BARLOW, ROBERT F., D.V.M.
c/o Elizabeth Fox, R.R. No. 3, Shelbyville, Ind.

Vouchers: C. F. Clark and B. J. Killham.
BOBST, GEORGE C. JR., D.V.M.

24 Appleton St., North Quincy 71, Mass.
Vouchers: C. F. Clark and B. J. Killham.

BURNHAM, ROBERT A., D.V.M.
Crete, Ill.

Vouchers: J. P. Hutton and C. F. Clark.
CROSEY, MAC, D.V.M.
Libertyville, Ill.

Vouchers: C. F. Clark and E. S. Feenstra.
ECKMAN, RICHARD R., D.V.M.

Onsted, Mich.
Vouchers: W. Crall and B. J. Killham.

HANSON, ROLAND L., D.V.M.
Beulah, Mich.

Vouchers: C. F. Clark and B. J. Killham.
PARLIN, MERL A., D.V.M.

R.F.D. No. 1, Fulton, Mich.
Vouchers: E. K. Sales and C. F. Clark.

REEDER, CARL E., D.V.M.
1127 Grant St., Eldorado, Ill.

Vouchers: C. Y. Reeder and C. F. Clark.
ROBERTS, CHARLES L., D.V.M.

Athens, Mich.
Vouchers: C. F. Clark and B. J. Killham.

WALLACE, EDWARD F. JR., D.V.M.
186 S. Marshall St., Hartford, Conn.

Vouchers: C. F. Clark and B. J. Killham.
WASKO, EDWARD D., D.V.M.

3153 Piquette, Detroit 11, Mich.
Vouchers: B. V. Alfredson and C. F. Clark.

WILLIAMS, RONALD T., D.V.M.
2906 Kalamazoo Rd., S.E., Grand Rapids 8, Mich.

Vouchers: C. F. Clark and B. J. Killham.
WILLIAMSON, STANTON P., D.V.M.

2621 Mishawaka Ave., South Bend 15, Ind.
Vouchers: A. S. Elnoris and E. K. Sales.

WRIGHT, ALBERT D., D.V.M.
Wells River, Vt.

Vouchers: C. F. Clark and B. J. Killham.

Second Listing

Alabama Polytechnic Institute*

Adams, Emory T., D.V.M., Chipley, Fla.

Becton, Paul, D.V.M., Silas, Ala.

Bishop, William W., D.V.M., 211 E. Thach St., Auburn, Ala.
 Bozeman, Edward C., D.V.M., 811 College St., Andalusia, Ala.
 Burch, Reuben F. III, D.V.M., 510 College St., Eastman, Ga.
 Carlson, Edward J., D.V.M., Box 37, Fruithurst, Ala.
 Caudle, Harold C., D.V.M., O.T.S. House, Auburn, Ala.
 Chapman, Cecil T., D.V.M., 816 Broad St., Jacksonville, Fla.
 Cochran, Albert B., D.V.M., Box 222, Pauls Valley, Okla.
 Derrick, Jesse D., D.V.M., Oglethorpe, Ga.
 Farr, Harry F., D.V.M., 814 E. South St., Orlando, Fla.
 Fulenwider, Howard M., D.V.M., 1310 Altamont Rd., Birmingham 5, Ala.
 Gersten, Eli, D.V.M., 103-26 68th Rd., Forest Hills, L. I., N. Y.
 Gilmore, W. H. Jr., D.V.M., 1505 Pickens St., Columbia 49, S. Car.
 Goode, Edwin R. Jr., D.V.M., 157 W. Hampton, Spartanburg, S. Car.
 Goodwin, Donald R., D.V.M., 906 Broadway, Little Rock, Ark.
 Grey, Ross M., D.V.M., Southern Pines, N. Car.
 Hatchett, Guy P. Jr., D.V.M., 1025 McCallie Ave., Chattanooga, Tenn.
 Headrick, Abner J., D.V.M., 123 Court A, Riverview Terrace, Tampa 4, Fla.
 Hester, Cecil J., D.V.M., Vina, Ala.
 Jordan, Milton T., D.V.M., Timberland, N. Car.
 Kuykendall, J. Curtis, D.V.M., Sallis, Miss.
 Love, James M., D.V.M., York, S. Car.
 Mathews, Mark W., D.V.M., 206 Jackson St., Vidalia, Ga.
 Morgan, John W., D.V.M., 4435 Patterson Ave., Richmond, Va.
 Moss, Ben F. Jr., D.V.M., Eastanollee, Ga.
 Mulhern, Francis J., D.V.M., 138 Toomer St., Auburn, Ala.
 Neisler, Wilbur E., D.V.M., Butler, Ga.
 Newton, Charles K., D.V.M., c/o Dr. J. R. Scully, Sarasota, Fla.
 Peacock, Charles G., D.V.M., 1406 Eslava St., Mobile 19, Ala.
 Pease, Lawrence H., D.V.M., 217½ Genelda Ave., Auburn, Ala.
 Pope, Benjamin A. Jr., D.V.M., Newsoms, Va.
 Raines, Thomas V. Jr., D.V.M., 1406 Eslava St., Mobile 19, Ala.
 Roberts, James W., D.V.M., Ocilla, Ga.
 Rosenberg, Donald W., D.V.M., 601 Garden Blvd., Belleville, Ill.
 Sharman, Robert S., D.V.M., 502 Vernon St., LaGrange, Ga.
 Sherrill, Abner D. Jr., D.V.M., 509 N. Main St., Fuscumbia, Ala.
 Sikes, James H. Jr., D.V.M., Manassas, Ga.
 Silverberg, Arnold, D.V.M., 2562 College St., Jacksonville, Fla.
 Smith, Marvin M., D.V.M., Rt. No. 2, Cullman, Ala.

Stroup, C. W., D.V.M., Somerville, Tenn.
 Sutton, Al, D.V.M., Sylvester, Ga.
 Thompson, Leon W., D.V.M., 719 Temple Ave., Danville, Va.
 Wheeler, Frank B. Jr., D.V.M., Box 385, Kentwood, La.
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U. S. GOVERNMENT

Provisions for Slaughterers Not Under Federal Inspection.—Secretary of Agriculture Clinton P. Anderson has announced the provisions under which non-federally inspected slaughterers may be certified, as provided in the Patman amendment, to permit a freer movement of meat in interstate commerce.

The conditions under which slaughtering plants may be certified are: (1) OPA price, rationing, and other regulations are being and have been observed; (2) the meat will move in legitimate trade channels within legal price ceilings; (3) the plant will meet sanitary standards prescribed in the regulations;

(4) meat production will be conducted under the supervision of qualified veterinary inspectors, including inspection before and after slaughter; and (5) the plant will participate in providing such meat for governmental agencies as may be required.

[It is gratifying to note that the usual sanitary standards apply, and, especially, to know that qualified veterinary inspection is being maintained.]

Dedicate Army Subsistence Laboratory.—Brig. Gen. R. A. Kelser, director of the Veterinary Corps of the Surgeon General's Office and Brig. Gen. R. A. Ozmun, of the Quartermaster General's office, Washington, D. C., were the principal speakers at the formal opening of the new research and subsistence laboratory at the Chicago quartermaster depot, June 9. A luncheon consisting exclusively of army food was a part of the ceremony. Major George H. Berryman, director of the laboratory presided. Among those present were Brig. Gen. J. E. Barzynski, commanding general of the Chicago depot.

Awards to Dental Officers.—Twenty-six officers of the Dental Corps of the Army have received awards for the performance of outstanding service in various theaters of operation.

USDA Owns World's Champion Cow.—The U. S. Dairy Division of the Department of Agriculture, Beltsville, Md., is the owner of the world's best cow, the Holstein-Friesian, Line Gerben Pride Colantha Piebe, 8 years and 6 months old, which made the all time, all age record of 1,207 lb. of butterfat and 32,191 lb. of milk in 365 days on three times a day milking.

Pest Census.—The Fish and Wildlife Service, USDI, has started the most meticulous census job ever undertaken. At its research refuge in Maryland, it will spray 117 prepared acres with insecticides that will kill every insect of the area, later it will take an "animal and insect census" to determine the do's and don'ts in the use of DDT in agriculture, the too free use of which is capable of upsetting nature's balance.

Safeguarding the Water Supply.—The water supply at official establishments, an important sanitary control measure, is the subject of discussion in Meat Inspection Division Memorandum No. 69, issued by Dr. A. R. Miller, chief of the Division. Emphasis is placed on the need for additional vigilance in this period of tremendous industrial activity and expansion, and especially so in establishments which are permitted to use nonpotable water for certain purposes.

The memorandum outlines the safeguards

which must be used to prevent contact of non-potable water with any edible product, and to prevent pollution of the potable water supply.

Personal.—A. R. Miller (I.S.C., '24), the present chief of the Division of Meat Inspection, Livestock and Meats Branch, USDA, successor to G. E. Totten (C.V.C., '98), retired,



Dr. A. R. Miller, Chief of Meat Inspection, USDA

has been engaged exclusively in meat inspection since entering the government service in 1926. He was inspector in charge of meat inspection at New York City until 1936 when transferred to Washington, D. C., as assistant to Dr. Totten. Dr. Miller was a machine gunner in World War I. He is also LL.B., George Washington University, 1940.

Equine Encephalomyelitis.—Dr. A. W. Miller, chief, Bureau of Animal Industry, USDA, reports 135 cases of equine encephalomyelitis to June 29, 1945. Iowa leads with 54 cases, followed by Illinois (21), Oklahoma (17), and Nebraska (12).

Foot-and-Mouth Disease.—The virus of this disease is so infective that it will cause the malady in dilutions as great as 1 to 10,000,000, and yet this country has been entirely free of foot-and-mouth disease since 1929. The regulations which make this possible are based upon research work that cost approximately \$85,000. The few outbreaks that have occurred in the United States have been eradicated at an average cost of less than \$4 million. The annual loss if the disease should ever become established would probably exceed \$200

million, according to estimates based on reliably reported losses that it causes abroad in our own livestock population.—*From Agricultural Research Administration, June 29, 1945.*

News from the Office of the Surgeon General

War Dog Recruitment Lags.—The Army Ground Forces desire 1,500 additional dogs for the development of infantry dog platoons for use with combat infantry divisions. Various Army units in this country and in overseas commands have been assigned 1,989 dogs, and the War Dog Reception and Training Center, Fort Robinson, Neb. has 1,368. Additional dogs from civilian sources are needed to insure the success of this program.

"Sulfa" in Wounds Discontinued.—The Army's accumulated experience in wound management does not justify the local use of any chemical agent in a wound as an antibacterial agent, and the local use of crystalline sulfonamides has therefore been discontinued except in the case of serous cavities where its use, while permissible under the direction of the surgeon, is not recommended.

Army Horses and Mules in Service.—The Army has 27,384 horses and mules at posts, camps, stations, and remount depots in the United States and an additional 16,215 with units in the various overseas commands. These figures do not include horses and mules serving with the Allied Armies, but are only for holipeds designated as U. S. Army animals.

Adequate Safeguards.—The Interservice Committee of the Army and Navy Medical Departments and Public Health Service met on June 8, and concluded that, since less exotic disease has been introduced into the United States by returning soldiers than medical officers anticipated, the present safeguards are adequate and no new steps are necessary.

Army Medical Department Anniversary.—On July 27, 1945, the 170th anniversary of the formation of the Army Medical Department was celebrated with the realization that it has grown into the largest organization of the kind ever known, and that it gives this nation's army the best medical care that soldiers have ever received. No army at any time in history has achieved a record of recovery from wounds and freedom from disease comparable to that of the American Army in this war, saving nearly 97 per cent of the wounded soldiers who reach Army hospitals, and holding the disease rate down to less than one in one thousand.

AMONG THE STATES

Arkansas

Legislature Passes New Livestock Laws.—One of the 92 laws passed by the state legislature provides for assessing an additional tax of 38 cents a gallon on liquor (total \$1.50) to finance livestock shows, cattle-disease control, and vocational education. Another compels dog owners to have their dogs vaccinated against rabies once a year.—*From Arkansas Gazette, June 7.*

State's First Government-Inspected Abattoir.—"Looks as if things will pick up along this line," writes Dr. Frank Hurlbut, retired BAI inspector of Yellville. The Little Rock Packing Co. announces that it is now a government-inspected plant, the first one in the state.

Vaccinates the Dogs and Issues the License.—Says the *Little Rock Gazette* of June 17: "City Poundmaster Aubrey Wilkinson will be at the fire station at Twelfth and Valmar streets tomorrow, Tuesday and Wednesday, to vaccinate dogs and issue licenses, City Collector Roy Beard said yesterday. Mr. Wilkinson will be at the fire station at Fourteenth and Pulaski streets Thursday, Friday and Saturday." There is no mention of any veterinarian participating, and Little Rock is not in the small town class.

California

Rabies Vaccination Law.—Tulare county, in the San Joaquin Valley, has passed a law which makes rabies vaccination of all dogs compulsory. It provides that every owner must have his dog vaccinated at least once a year by a licensed veterinarian, and that a certificate be filed with the county health officer within five days. Violators are subject to fines as high as \$200 and/or confinement in the county jail for as long as 100 days.

Connecticut

Cow Dealers Fined.—Two leading cow dealers from eastern Connecticut were convicted and fined on charges of importing cattle without health charts, failing to keep records, and deliberate switching of ear tags from healthy to sick cows.—*From Providence Journal, May 17, 1945.*

[The beginning of this action was reported in the May JOURNAL under Rhode Island news.]

Georgia

New Association.—The North Georgia Veterinary Medical Association was formed at a meeting held May 15, 1945, in Atlanta. The

following officers were elected: Dr. E. E. Chambers, Trion, *president*; Dr. John Riddle, Marietta, *vice president*; Dr. T. B. Clower, Atlanta, *secretary*; Dr. Urton Munn, Atlanta, *executive board member*.

The first meeting was held at the veterinary hospital of Dr. O. N. Mathis, Griffin, on June 12, 1945. There was a round-table discussion of practice problems, and Dr. Clower showed films depicting clinical cases, tuberculin reactions, and postmortem lesions from a badly infected herd. Dr. C. Rife, Atlanta, was appointed a committee of one for public relations.

S/E. E. CHAMBERS, *President*.

Personals.—Dr. J. M. Sutton (K.C.V.C., '14), Sylvester, was appointed resident state secretary at a recent meeting.—Dr. J. L. Hopping (O.S.U., '17), Atlanta, was elected alternate to the House of Representatives.

State Rabies Vaccination Law.—In March, the legislature passed a law requiring all dogs in the state to be inoculated against rabies before July 1 of each year, and to wear a tag showing that this has been done. Failure to vaccinate makes the owner guilty of a misdemeanor and subject to a fine.

Illinois

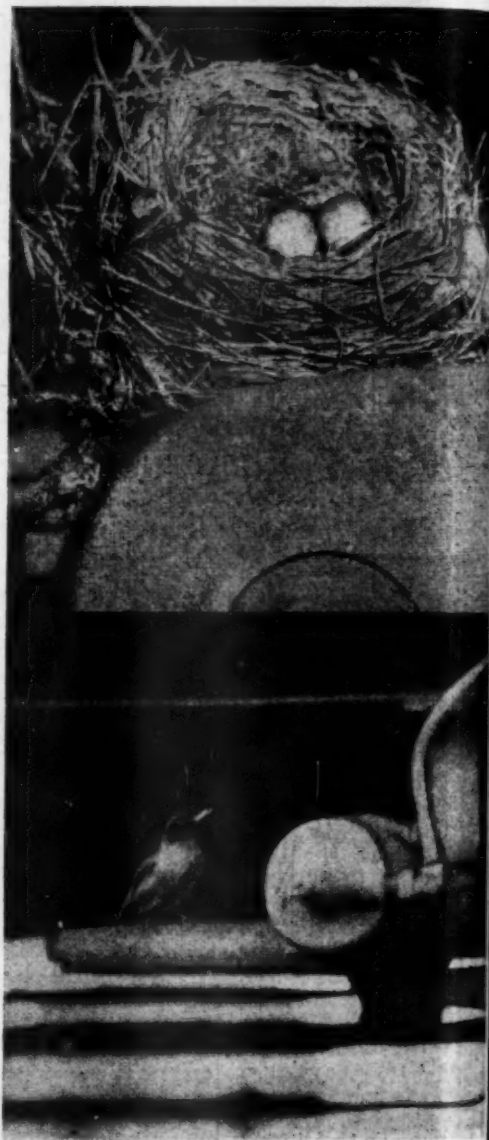
Chicago veterinary officers held their fourth monthly conference on June 18, 1945. Forty six officers and two civilian visitors were present to hear Major Walter Venzke discuss "Gonadotropic Hormones, Their Application and Clinical Uses in Reproduction."

Chicago Veterinary Association members were invited to attend a showing on June 26 of the sound film "How Milk Is Made," which has been prepared by the Ralston Purina Co., under the direction of Dr. W. E. Petersen, the narrator. The picture presents the basic considerations in milk production in an excellent manner.

New Poultry Improvement Plan.—Leaders of the poultry associations met in Chicago, June 24, with key men of the U. S. Department of Agriculture, and launched a breeding program for the production of a dual purpose chicken, a chicken that will have more white meat, more tender drumsticks, smaller bones, faster growth, and no let down in laying. A committee was named to start the project all over the country. D. D. Slade, Lexington, Ky., secretary of the International Baby Chick Association, was chosen to head the committee. The project will be financed by a national grocery chain which has taken a leading part in reforming the marketing of poultry. But, somehow with all honor to the power of genetics, it's hard to get enthused over this

bird of the future until the dual purpose cow passes into the limbo of forgotten dreams.—Anon.

Ornithophilia of a Train Crew.—It happened in Chicago in June, when the crew of a Chicago and Northwestern train, running daily between Barrington and Chicago, spied a mother robin and her nest on the airbrake drum of a



—Our Apologies to The Chicago Sun

passenger coach. The discovery made the headlines of *The Chicago Sun* for two days, along with half a page of pictures. So intent was the crew on helping Mrs. Robin to complete her springtime chore that the car, whisked to

Chicago in the morning, was parked at the same place every evening for the waiting robin's convenience. She occupied her nest at night, flew off in the morning when the train gained speed, and then perched near by 'till the car returned in the evening. The candid camera gives the proof. The end is not told and does not matter. When a robin fails she tries again. But, what does matter, quite a bit, in these days of human atrocities, is the demonstration that in this neck of the woods, kindness *does* dwell eternal in the human breast. Illinois would like to tell the JOURNAL readers, through this episode, that ornithophilia is but one of many "philes" needed in this world gone mad.

Veterinary Corps Officers stationed in Chicago held a conference at the Chicago Quartermaster Depot on July 9, 1945. The program was highlighted by a well-illustrated lecture given by Dr. James Farquharson, president of the AVMA and professor of surgery and clinics, Colorado A.&M. College. In discussing the subject of large animal surgery and medicine, Dr. Farquharson stressed the use of local and general anesthetics in successful surgery. Colored films illustrated a number of surgical procedures, methods of restraint, and general clinical diagnosis.

Sixty six members of the Veterinary Corps and six civilians attended. The civilians were Drs. Hagan, Simms, Hardenbergh, and Klusendorf of the AVMA and Dr. Harry Kingman of Wilson & Co. Members of the program committee for this meeting were Major M. K. Walters, Capt. E. S. White, and 1st Lieut. R. A. Bruce, the latter acting as chairman of the conference.

s/ William C. Schofield,
Major V.C., Secretary.

Superfotation.—Dr. E. E. Brittin, Pekin, is reported in the *Pekin Daily Times* in connection with a case of obvious superfotation in pigs. A Chester White sow owned by Clyde LaRosh, R. R. 1, Pekin, farrowed four pigs, and sixteen days later farrowed ten more.

Personal.—Lieut. Dwight L. Lichty, formerly of Woodstock, writing from a post somewhere "north of the equator and west of the international date line," makes the following interesting comments:

"The natives are serf-like orientals and there is livestock here—horses, cattle, pigs, goats, and chickens. Luckily, I have been able to do a little practice which has been very interesting, and have come across a native veterinarian who is well educated and capable. We are also doing some abattoir work, that is, supervising and inspecting of goat slaughter for natives—and by them. Their agricultural

methods too are primitive and quaint to say the least. It is a rich experience and we are getting along fine."

Research Fellowships.—The Abbott Laboratories, North Chicago, have appropriated \$50,000 to provide research fellowships in the field of medicinal products, at ten prominent universities, the universities having the sole right to the results of the work conducted.

Guernseys Bring High Prices.—At the Midlewest Guernsey sale at Elmhurst in May, 48 animals consigned by 26 breeders brought an average of \$1,326. One bull, St. James Champion Bruce, brought \$4,500.

Mastitis Control Program.—Forty practitioners in 37 counties are treating 517 dairy herds under the program set up by the Department of Animal Pathology and Hygiene of the state university. The number of cows under treatment as of April 1, was 11,247 of which 45.2 per cent were found to be infected on the initial test. On the third test the percentage was 25.3. All practitioners of the state are urged to participate in the program.—*From Animal Pathology Exchange (quarterly) April-June 1945.*

Indiana

On the Italian Front.—Capt. Melvin O. Nottingham, V. C. (Ga., '32), of Summitville, Ind., is one of the men who was engaged in



—Signal Corps, U. S. Army Photo
Captain Nottingham (left), of the Peninsular Base Section Remount Station, in Italy, is preparing the horse for a tumor operation.

the difficult task of procuring, supplying, and conditioning mules and horses throughout the Italian campaign.

Iowa

A Remount Station in Italy.—Capt. Clement E. Watson, V. C. (K.S.C., '35), of Mason City, Iowa, was connected with the unit that fur-



—Signal Corps, U. S. Army Photo

Captain Watson (right) treats a mule, injured in shipment, at the Peninsular Base Section Remount Station in Italy.

nished the Fifth Army with 8,000 army transport mules, over 1,000 mountain artillery mules, 900 riding horses, close to 200 draft horses, and 678 United States mules.

Personal.—Major Walter R. Anderson, V.C., AUS, of Slater, was recently promoted to the rank of lieutenant-colonel.

Dr. E. S. Dickey (K.C.V.C., '06), veterinary advisor of John Morrell & Company, Ottumwa, since 1936, whose resignation, effective July 1, is announced, leaves the veterinary service with a host of friends and admirers few professional men can claim to possess. To look around for a job in a retail drug store is a reason given, and that opens up a phase of the Doctor's professional life everybody doesn't know. He's been a registered pharmacist for forty-one years, graduate of the School of Pharmacy, University of Kansas (1902), and was registered to practice pharmacy in Missouri (1904), teacher of pharmacy and materia medica at the Kansas City Veterinary College, where he was graduated in 1906 just before entering the meat-inspection service of the BAI, holding key positions in that service at Duluth, Sioux Falls, Milwaukee, Sioux City, and Ottumwa. He was retired for superannuation in 1936. Besides his sound literary con-

tributions and association activities, one mostly recalls the measures he launched for the control of livestock diseases important to the meat-packing industry while serving as advisor for the Morrell company.

Dr. Dickey was born at Olathe, Kan., July 2, 1874. The records say: Mason, Presbyterian, authorized instructor in Red Cross First Aid, Committee on Agriculture, Ottumwa Chamber of Commerce, member of the U. S. Livestock Sanitary Association, AVMA, and the Iowa State and Eastern Iowa Associations. Dickey is the kind of a chap the boys will miss. So long, and good luck.

Kansas

District Meeting.—Veterinarians of District VII held a meeting at Topeka on June 1. Dr. A. H. Quin, Kansas City, discussed "Current Practice Problems," and Dr. Frank Jones spoke on "Saddle Horses, Their Way of Going," which was illustrated with a picture showing the Tennessee walking horse.

Personal.—Capt. George W. Atkinson, V. C. (K.S.C., '43), of Hutchinson, is now stationed at Indiantown Gap, Pa.

Rabies Quarantine.—Leavenworth county has been placed under 120 days quarantine for rabies.

Anaplasmosis.—The *Bulletin of the Kansas Veterinary Medical Association* published a map which shows the locations of cases reported from Nov. 1, 1943 to Nov. 1, 1944. August, September, and October showed largest number of cases.

Junior AVMA officers elected for the fall semester are: *president*, Geo. T. Woods, Caney, Kan.; *vice president*, Wm. R. Theobald, Raub, N. Dak.; *secretary*, Robt. K. King, Broken Arrow, Okla.; *treasurer*, James H. Burr, Covington, Va.; *sergeant at arms*, Wm. R. Jackson, Neosho, Mo.; and *critic*, Fred A. York, Manhattan, Kan. Under the guidance of this group of enthusiastic young people the chapter will continue to function actively as a material influence in the development of character and professional understanding.

Veterinarian Elected Mayor.—Dr. E. B. Zickefoose, Rossville, has been serving his city in this capacity since the spring election.

Graduating Class.—On May 20, 1945, Kansas State College conferred the degree of Doctor of Veterinary Medicine on 54 students and the school of Veterinary Medicine is proud of these recent graduates because (quoting) "no group has established a better record during their college days than this one." [We are

happy to add that upon receiving the degree each member of the class joined the AVMA.]

Kentucky

Popular Nongraduate Dies.—Dr. David Smith, longtime practitioner of Bullitt and Jefferson counties, died at the Norton Memorial Infirmary in Louisville in May. He was elected an honorary member of the Kentucky Veterinary Medical Association in recognition of his ability and devotion to the development of the veterinary profession. His death removes one of the few remaining nongraduate American veterinarians who endeared himself to the graduate members through exemplary professional conduct and usefulness. He was livestock inspector of Bullitt county for thirty years, and was instrumental in having many of the state's constructive livestock laws passed. He was always counted on as being the life of the meetings he attended.

S/F. M. KEARNS, *Secretary*.

Massachusetts

College Men Meet at Cherry Hill Farm.—A notable event of veterinary history was the meeting of educators of six New England states



Dr. Elmer A. Woelffer (Corn., '31)



Winter scene at the Cherry Hill Farm, North Beverly, where a longtime program of herd improvement is under way—a source of important quantities of certified milk for the Boston market.



COLLEGE MEN ATTENDING CONFERENCE

Left to right—A. R. Merrill, professor of dairy industry, Connecticut State College; Mason H. Campbell, dean and director of Rhode Island State College; N. N. Allen, associate professor of dairy production, University of Vermont; Dr. E. A. Woelffer, head of Hood Farms; G. M. Cairns, head of animal industry department, University of Maine; K. S. Morrow, professor of dairy husbandry, University of New Hampshire; V. A. Rice, head of animal husbandry department, Massachusetts State College.

on November 21 last, at the Cherry Hill Farm, North Beverly. The farm is not only one of the most famous certified milk farms of this country but is also distinguished for the herd-improvement program instituted and directed by an alumnus of the New York State Veterinary College, Dr. Elmer A. Woelffer ('31), at whose invitation the meeting was held. The college men were prominent dairy specialists of their respective institutions—the teachers of thousands of future dairy farmers. Cherry Hill is one of four farms operated by the Farms Department of H. P. Hood & Sons, of Boston, which have been making rich contributions to the advancement of milk hygiene and the production of purebred dairy cattle. Dr. Woelffer is also a past president of the American Association of Medical Milk Commissions, and an active worker in that field. The event is singled out for veterinary history because of what it represents in the training of men for high places in the animal production sphere. Cherry Hill Farm, which Dr. Woelffer was wisely chosen to direct, is said to be famously arranged for the production of certified milk.

Manitoba

Equine Encephalomyelitis Vaccination in Man.—L. M. Heath, V.S., D.V.Sc., Animal Disease Research Institute, Hull, Que. (*Canad. J. Pub. Health*, May, 1945), describes the probable results attainable from mass vaccination of populations against equine encephalomyelitis with a commercial chicken-embryo vaccine. In 1942, 3,000 such vaccinations were performed on adult males, 21 years and older, each receiving two doses of 1 cc., one week apart. The blood of every third case, was examined for neutralizing antibodies before receiving the first dose of the vaccine. Of these (1,013 in all), 192 (18.95%) possessed such antibodies obviously on account of previous exposure (subclinical infection). Six weeks after vaccination, when 208 specimens, negative before vaccination, were reexamined, 108 (52.4%) had become positive after vaccination. In 1943, all but 9 of 300 inmates of a hospital for mental diseases, near Winnipeg were negative before vaccination and 150 (51%) were positive for neutralizing antibodies nine weeks after receiving two 1-cc. doses of the vaccine. The neutralizing tests were made by Dr. Chas. A. Mitchell of the Institute. The findings were submitted without comment.

Michigan

Weekly "Stables" on the Farm.—Haasjes of Shelby, recalling the orderly farms of prewar Holland, suggests that the veterinary profession in this country take the lead in develop-

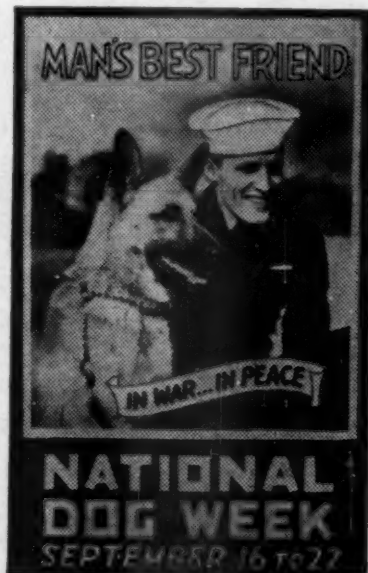
ing the custom of setting Saturday aside as cleanup day just as every good housewife does. Wash the stable windows, rake the yard, sweep down the cobwebs, groom the animals, trim the shrubbery, scrub and paint and whitewash, straighten up that gatepost and nail up that loose board, and even see that the hired man takes a bath are listed on the proposed trestleboard for Saturday—all day in winter and half day for summer—for economic, esthetic and hygienic reasons. Whether we like to be told or not, esthetic rural estates in the U.S.A. are scattered, here and there, among too many ramshackle, tumbled-down farms that spoil a lot of landscape and violate plenty of sanitary rules. The Doctor thinks the veterinary profession is the right agency to start the reform. The idea makes sense and would pay good dividends. It is not "sissy."

Minnesota

Veterinarians Complimented.—The proceedings of the staff meeting of the Mayo Clinic for April 4, 1945, carry the following statement by Thomas L. Pool, M. D.: "First it is well to state that I make no claim to authoritativeness on the subject of infertility. In fact, there are probably no real authorities in this field except those who have studied veterinary medicine. These investigators have had the opportunity of extensive study of experimental animals under controlled conditions."

Missouri

Kansas City Veterinary Medical Association.—At the meeting on June 19 the following program was presented:



Dr. Wm. Daseler, Topeka, Kansas: "The Disemper Complex."

Dr. E. F. Sanders, Kansas City, Kansas: "Infectious Enteritis Feline."

Dr. C. W. Bower, Topeka, Kansas: "Euthanasia."

Dr. G. L. Dunlap, Kansas City: "Rabies."

Dr. E. W. Theiss, Independence: "Fractures."
s/G. B. SMITH, *Secretary*,

Montana

Agriculture and Mining Compared.—Writing in the *Chicago Tribune* (June 3), Alex Small tells the world that Montana is just a mining state with nothing to boast about except copper and Butte and Fort Peck dam, but truth refutes the insinuation. In cold figures, the income from farming and livestock now runs around \$235,000,000 a year; from mining \$85,000,000, of which only \$35,000,000 is from copper; from lumber \$12,000,000; and from oil \$9,000,000. A later report gives the state's income from farming and livestock as \$254,000,000; from mining \$61,000,000, and from lumber \$12,500,000. These figures are significant. The over-shadowing income from the land is not only ever-lasting but is wholly man-made, and can be credited largely to the long-time, excellent veterinary service the state has maintained. Mining, thanks to it nevertheless, is but the hauling away of unreplaceable material Nature has laid down in determined amounts. The whale of a difference between farming and mining in human affairs is something mankind is only beginning to ponder. The builders of Montana in our time have not been of the mines and big dams. They were the functionaries of Helena and Bozeman, watchmen of the state's ranches whose stock is not quoted on Wall Street. Know them?

Nebraska

Central Nebraska Veterinary Medical Association.—The Association met at Lexington, June 26, 1945, after being inactive for ten years. Dr. F. L. Knappe, Lexington, was elected president; Dr. L. J. Boulier, Cozad, is secretary-treasurer, both having served in their respective capacities when the organization held its last meeting.

Dr. J. D. Ray, Omaha, and Dr. Frank Breed, Lincoln, led a discussion of veterinary problems in which the 45 members present joined. Dr. J. R. Snyder, Lincoln, outlined the plans for operating and enforcing the regulations governing brucellosis vaccination and control.

s/PAUL L. MATTHEWS, *Resident Secretary*.

New York

Penicillin per Os.—Dr. Raymond L. Libby of the Lederle Laboratories read a paper on "Oral Administration of Penicillin—Animal and Human," before the annual meeting of

the Metropolitan Certified Milk Producers in New York City, March 5.

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Refresher Course.—The faculty of the New York State Veterinary College, Cornell University, Ithaca, announces its intention to offer a short course for the benefit of veterinarians returning from military service. Dates will be determined when a sufficient number of applications have been received.

The basic course will be four weeks in length, but two, four, or six additional weeks may be scheduled. Emphasis will be placed on practical application of new methods and new remedies. Lectures, clinics, and field trips will be conducted by staff members, and there will be daily discussion groups in the late afternoon.

A registration and tuition fee of \$25.00 will be charged for the four weeks course. Additional information may be obtained by writing to Dr. Hadley C. Stephenson, director of Post-war Refresher Courses, New York State Veterinary College, Cornell University, Ithaca.

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Calfhood (Brucella) Vaccination.—The progress of calfhood vaccination in the state is shown by the fact that of the 400,000 calves born annually, 180,000 were vaccinated last year, and it is estimated that one third of the total calf crop will be vaccinated next year.

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Lawful to Trim Dogs' Ears.—The Shonk-Thompson bill forbidding the cropping of dogs' ears was revised in April by Governor Dewey. Dogs owned or kept in New York may now have their ears cropped provided the operation is done by a licensed veterinarian and under anesthesia.

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Personal.—Governor Dewey has appointed William C. Langley, banker-sportsman, of Westbury, L. I., a member of the New York State Racing Commission, vice Herbert Bayard Swope, resigned. The term runs to May 1, 1946. Mr. Langley is a key man in the Meadow Brook Steeplechase Racing Association, and other sporting societies.

North Carolina

Licensing Examinations, written and oral, were conducted by the State Board of Veterinary Examiners for 25 applicants on June 12, at Greensboro. Previous examinations had been held at Raleigh.

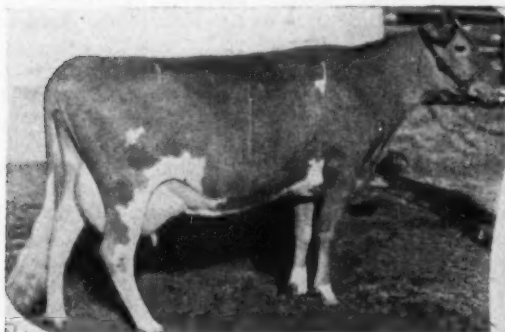
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Clinic Held at Fair Grounds.—At the Central Carolina Veterinary Medical Association clinic on June 13, 2 horses, 1 mule, 4 cows, 1 goat, and 7 dogs were presented. About 125 area veterinarians attended, but all O. D. T. regulations were met.

Ohio

Dr. E. W. Porter, Reynoldsburg, was the "Keep 'em Healthy" guest on the station WLW "Everybody's Farm Hour" broadcast at 11:00 a.m. CWT, July 7. His subject was, "How Livestock Diseases Are Spread."

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—From *Guernsey Breeders' Journal*
"Plainsman's Radium Girl" became the Ohio state champion Guernsey when she produced 18,186.2 lb. milk and 1,002.6 lb. fat in class B, at Welcome-In Farm.

Ontario

Felicitates the Veterinary Surgeon.—An editorial (unidentified) sent by Dr. J. A. Campbell, of Toronto, comments at length on the meeting convened at the Ontario Veterinary College at Guelph, June 22, to honor retiring Principal C. D. McGilvray. The biographical sketch contained having been published in the June issue of the JOURNAL need not be repeated, but the compliment paid to the veterinarians of the Province is a pleasure to reprint: It reads:

The veterinary surgeon is virtually indispensable to the Ontario farmer when valuable animals are sick. He turns out in all kinds of weather to save the lives of thoroughbred or purebred stock, for which he receives modest fees. It speaks volumes for the high standard set in Ontario that animals bred in this Province now are in demand in the United States, and even in Great Britain and the Channel Islands, from which the foundation stock came. In helping to maintain the quality and breeding of Canadian live stock, Dr. McGilvray and the men who trained under his guiding hand have played an important part.

Pennsylvania

Increased Funds for Veterinary School.—At the last session of the legislature, a special appropriation bill was introduced and supported by executive officers of the University of Pennsylvania to provide the sum of \$350,000 for the School of Veterinary Medicine for

a two-year period. The bill was passed and has been signed by the Governor. In addition to this sum, the university will continue to provide the same amount of funds to the veterinary school as in previous years. The increased budget will be utilized for developing and expanding several departments of instruction and for improvement of the physical plant.

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Personal.—Lt. Col. Harry J. Robertson, V. C. (U.P., '39), received the Legion of Merit award for his activities in Iceland, at which time he was a major.—Lieut. Vance A. Carlson, V. C. (U.P., '43), of Port Allegheny, is stationed at Cushing General Hospital, Framingham, Mass.

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Personal.—Major Guy F. Abell, V. C. (U.P., '35), of Rome, is now station veterinarian at Camp Hood, Tex.

Utah

Cattle Liver Fluke Control.—Two counties, Duchesne and Uintah, have been so favorably impressed with the success of treating cattle liver flukes with hexachlorethane that the cattlemen in these counties have provided, in each community, chutes and pens for handling cattle so they can be treated quickly and conveniently. The treated cattle make more rapid gains, mature earlier, and more of them reach the market.

Foreign

Eire

Veterinary Service to be Reorganized.—The Committee on Post-Emergency Agricultural Policy (*The Veterinary Record*, May 26) has recommended extensive revamping of the veterinary service in connection with the appointment of a director of veterinary services to function under the Minister of Agriculture and the establishment of an institute of research and central research laboratory and ten branch laboratories. The installation of pasteurizing plants, testing cattle for tuberculosis free of charge, conducting a meat-inspection service and a coordinated brucellosis-control program are among the proposals. The aim is to bring the entire veterinary services under one command. The seriousness of bovine tuberculosis is stressed and no hope is held out unless the livestock owners become impressed with the advantage of taking corrective steps.

France

Medical Research Declined.—French medicine has reached a crisis. Though the clinical level has been maintained, its scientific level has declined in the last twenty years through

lack of investigators, laboratories, and organized coöperation. The results are apparent. The truth must be told to those who have but to turn to their neighbors to know why France has been surpassed in the glory of discovery and what is inescapable to recover the lost position. The discovery of anatoxins (toxoids) and the isolation of paraminophenylsulfamide shows what can be achieved by the French medical centers. The United States and Russia furnish patterns to follow. Medicine in its last analysis must be the study of the relations between human, veterinary, and plant medicine. Many other professions besides that of the physician should be charged with the improvement of these relationships. Physicians cannot accomplish their mission by working alone. All will have to collaborate with one another.—*From Paris Correspondent to the J.A.M.M.A., June 9, 1945.*

Germany

Killing of the Mentally Deranged.—Draughts or injections of morphine and scopolamine were used to kill the inmates of the psychiatric institute, Oberwalde Meseritz, near Berlin, according to an investigation carried out by the medical service of the army of occupation. Mental cases were brought in from all parts of Germany by rail in groups of 100 to 300, the records of the institute show. The death rate of the institute was 97 per cent. The average sojourn of the patients was from seven to ten days. The head nurse of the women's department captured in a neighboring town admitted with "indescribable callousness" that she had killed between 1,000 to 1,500. Doctors, nurses, and orderlies ran away on the approach of the Russian troops. Inmates stated they were confined to the institute for "defiling the purity of Aryan blood."—*From J. Am. M. A., 128, (May 5, 1945): 47.*

Entering Coblenz

in 1919



—*From Veterinary Military History*



in 1945

—*Signal Corps, U. S. Army Photo*

Great Britain

Refresher Courses.—According to the *Veterinary Record* (May, 1945), the National Veterinary Medical Association proposes to compile a list of practitioners who will be willing to give of their time for instructing veterinarians returning from the military forces. [This appears to be a compromise between the veterinary college refresher courses and the internship which has been proposed here.]

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Duke of Beaufort Speaks.—At a dinner in Southampton the duke said: "As practical agriculturists we know how important to our interests is veterinary research."—From *Veterinary Record*, May, 1945.

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Rocket Bomb Damage.—The most diabolical act ever perpetrated on a civilian population began with the firing of rocket bombs on southern England from Sept. 8, 1944, to March 27, 1945. In all, 1,050 reached the country. The casualties were 2,754 killed and 6,523 seriously wounded. Fifty to sixty bombs a week fell during February and March. The worst single incident was the fall of a rocket on the Woolworth store in southeastern London during the lunch hour, when 160 were killed and 108 injured, mostly women and children. One rocket in March reduced two blocks of apartments to rubble, killing 134 and seriously injuring 49. Another of these more serious tragedies was the fall of a rocket in the crowded Farringdon market in March. Here the casualties were 110 killed and 123 gravely injured. Thirty-five hospitals were struck. Among the killed were 7 American soldiers.

Guam

Holstein-Friesian Dairy Farm.—The Navy has cleared 250 acres of jungle land; planted it in *Leucaena glauca*, a native grass equal in feeding value to alfalfa; built dairy buildings; and installed 65 head of Holstein-Friesian cows, and turned the management over to the Seabees, one of whom is the experienced son of a large Louisiana dairyman, Nathan C. Knight, S 2/c, of Quincy, La. The director of the project is Paul A. Gantt who has had twenty years' experience with livestock in Hawaii and the Philippines.

India

Cholera Grave.—Cholera in Calcutta is a grave menace to the British and American troops in the Asiatic theater. Two hundred deaths in a day were reported. Calcutta is a great center of transportation and an im-

portant leave center for troops of the Allied forces. Corporate administration of Calcutta is lax. A correspondent writes that there is much to control to stop epidemics here: dirty markets, foul water, beggars, cattle in the streets, scattered garbage, etc.

Mexico

Scientific Professionals Excluded.—Under the terms of a new federal law designed to dispose of the foreign influence in the scientific professions, United States physicians and veterinarians will not be permitted to practice in this country. The medical but not the veterinary profession is specifically mentioned in the text of the ban. Certain exemptions are bonafide political refugees and specialists not available among the home talent. What to do about those already practicing here has not been decided. Leading medical authorities believe that these will merely be required to register their qualifications.

Okinawa

Mosquitoes.—While the high casualties of all ranks in Okinawa made the headlines, only the lamented Ernie Pyle wrote of the mosquitoes of that ill-fated island. Quoting: "That was one of the most miserable damn nights out of hundreds of miserable nights in this war. . . . Right after dark the mosquitoes started buzzing around our heads. These Okinawa mosquitoes sound like a flame thrower. By the slaps at mosquitoes each of us knew that the others weren't asleep. I'm the world's choicest morsel for mosquitoes. Every morning I get up with at least one eye swollen shut. . . . I fell asleep at 4:30 from sheer exhaustion and that gave the mosquitoes a clear field. My right eye was swollen shut in the morning as usual. . . . All of which isn't a very warlike night to describe, but I tell it so you'll know there are lots of things besides bullets that make war hell."—Condensed from *Bulletin of the U.S. Army Medical Department*. Taken from the *Washington Daily News*, April 18, 1945.

Russia

Scientist Rescued.—Professor Albert Szent-Gyorgyi, of Budapest, who won a Nobel Prize for having discovered the chemical entity of Vitamin C, was rescued from the Nazis and is now safe in Moscow. With the aid of the Swedish Legation he was able to save important manuscripts covering his latest researches. He escaped in the guise of a chauffeur. The Professor is a world-famous medical chemist.

The American Red Cross uses dogs as companions for wounded soldiers during the convalescent stage of their hospitalization.

Union of South Africa

Permits Manufacture of "Oleo."—For the first time the government has granted permission to manufacture margarine, "in the interest of low income groups." The danger that this is an entering wedge from which the whole dairy industry of the Union may suffer is emphasized by the *South African Friesland Journal* which points out how the dairymen of Holland were crushed by a powerful margarine trust, and forced into such a "low income group," that they had to eat margarine.

COMING MEETINGS

Short Course for Veterinarians. Purdue University, Lafayette, Ind., Oct. 11-12, 1945. C. R. Donham, Dept. of Veterinary Science, Purdue University, Head.

American Veterinary Medical Association. Business sessions only of Executive Board and House of Representatives. Palmer House, Chicago, Ill., Aug. 20-22, 1945. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

STATE BOARD EXAMINATIONS

Florida—The Florida Board of Veterinary Examiners will hold its next examination on Sept. 3-4-5, 1945, at the George Washington Hotel, Jacksonville. Address further inquiries to H. C. Nichols, secretary-treasurer of the board, Box 405, Ocala, Fla.

MARRIAGES

Dr. Morris Himmelstein (M.S.C., '40), 4103 Pimlico Rd., Balto., Md., will be married to Miss Miriam Cooper, June 4, 1945.

BIRTHS

To Major (K.S.C., '38) and Mrs. R. L. McMahon, Baer Field, Ft. Wayne, Ind., a daughter, Anne Rae, May 15, 1945.

To Dr. (Tex., '44) and Mrs. Roscoe Owen Sealy, Jr., 2039 W. Gramercy, San Antonio, Texas, a son, Roscoe Owen III, June 12, 1945.

To Dr. (K.S.C., '38) and Mrs. David Jacobson, 1302 Third St., Woodward, Okla., a son, Daniel Philip, June 19, 1945.

DEATHS

Lawrence Avery, 59, Washington, D. C., died June 13, 1945. Dr. Avery was a native of England, and received his veterinary training at the United States College of Veterinary Surgeons. He entered the BAI in 1914 and served continuously until his retirement in 1944. Since 1929 he had been administratively in charge of the Zoological Division's Field Station at Beltsville, Md. The present group of buildings and many of the technical facilities there are products of his planning and scientific foresight and skill. Upon his retirement he received commendation for his services from high officials.

Godfrey C. Bevan (A.P.I., '15), 62, Maquoketa, Ia., died July 1, 1945. Dr. Bevan served in the Veterinary Corps during World War I. He began practice at Bellevue, Ia., and served on the State Bovine Tuberculosis Eradication force from August, 1919 to November, 1928, when he took over the practice of the late Dr. H. A. McIntire, which he continued until his death.

James I. Gibson (Ont., '87), 80, Cedar Rapids, Ia., died July 6, 1945. Dr. Gibson began practice at Denison, Ia., and was engaged in various branches of the veterinary profession during his life-time, having been state veterinarian of Iowa, livestock commissioner at South St. Joseph, Missouri livestock market, and representative for Jensen-Salsbery Laboratories. He served as organizer for the Illinois Veterinary Medical Association and as president of the Iowa and Missouri Valley Associations. He was admitted to membership in the AVMA in 1898.

O. L. Hutchcroft, Burlington, Ia., died during April of this year.

John S. Pollard, 8 Pemberton St., Providence, R. I., died May 29, 1945.

William Hamilton, 80, Bellingham, Wash., died May 29, 1945 after a lingering illness. He was born in St. Mary's, Ontario, in 1865. He had practiced in Boone, Ia. and later became associated with the BAI, which connection he maintained until his retirement in 1922.

W. W. Worcester, North Hollywood, Calif., died May 24, 1945. Dr. Worcester graduated from The Ohio State University in 1900 and worked with the BAI for forty-two years prior to his retirement, in 1943.

THE VETERINARY PROFESSION AND THE WAR

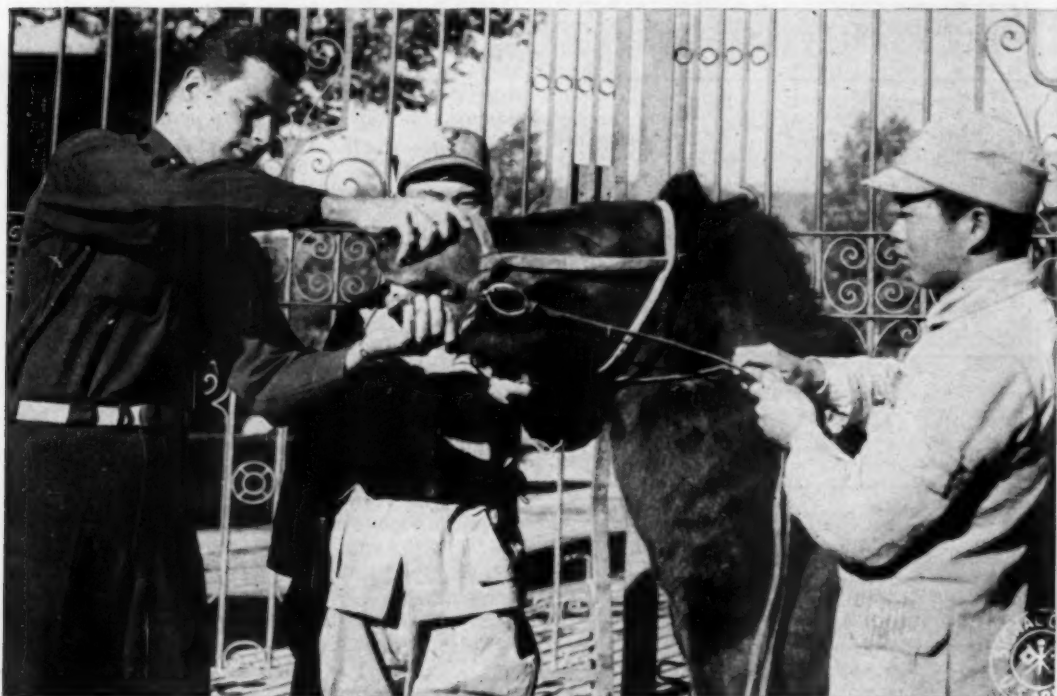
Veterinary Service Performs Outstanding Job

One of the outstanding jobs which enabled the Allied war machine to continue rolling even into the mountains and fields of "der Vaterland" was the vigilance of the U. S. Army Veterinary Corps in the inspection of food supplies, a vigilance and inspection maintained on a never-ending flow of foodstuffs arriving in the United Kingdom from the United States.

Although there was a time when the Army veterinary service was charged primarily with the care and treatment of animals, in the present conflict the inspection of meats, meat foods,

and dairy products is its most important duty. Prior to purchase, veterinary inspections are made to see that they meet rigid government requirements as to type, grade, and quality. All succeeding inspections are made to determine that foods of animal origin are sound and fit for human consumption before issue to troops. At the request of the quartermaster in this theater, the inspection has been increased to include all subsistence items, including fresh vegetables, canned fruit juice, fruits, and other items.

With American Troops in China



—Signal Corps, U. S. Army Photo

Horses, mules, and ponies are a part of the military organization of American troops in South China. This is the picture of an unidentified veterinary officer protecting the quartermaster against the procurement of superannuated solipeds.

Lt. Col. Robert J. Robertson,* chief of the Veterinary Division, Medical Section, United Kingdom Base, Surgeon's Office, London, is constantly on the alert to advise the medical department and the quartermaster corps on all matters pertaining to food procured for the troops. The veterinary service, whose primary interest, as part of the medical department, is the health of the troops, sees to it that only sound and wholesome products are issued. All food items are inspected upon receipt at the ports, upon arrival at depots, while in storage, and again, prior to issue.

Highly perishable items such as beef, pork, poultry, and butter are moved in refrigerated trucks and stored in conveniently located cold storage plants held at 14 to 16 F. Cheese is stored in rooms maintained at 36 to 40 F. To facilitate the inspection of large quantities of fresh eggs, candling rooms and equipment were set up at all depot and hospital installations.

As part of the routine inspection, necessary attention is given to sanitary conveyance of supplies, proper storage and refrigeration, examination of containers, inspection for age and possible deterioration of products, and laboratory examination of questionable items. This constant supervision, inspection, and reinspection has reduced spoilage to negligible amounts. Foods classified as unfit for human use, and recommended for condemnation, are turned over to the British Ministry of Food for salvage.

Veterinary officers and trained enlisted technicians are assigned to all ports and depots, and each general and station hospital has a trained technician to supervise the care and handling of subsistence items. Many were employed, as civilians, in food inspection, and, with the benefit of years of experience, have quickly adapted themselves to Army procedures. Many received preliminary training at Army veterinary schools for enlisted personnel in the United States.

The veterinary service has cooperated with the quartermaster, in improving types of packages and in developing new methods of packaging to prevent food spoilage and loss in shipping.

Veterinary care and treatment has been provided for all guard dogs used by the U. S. Army, and complete records are maintained. Inspections are made of guard dog installations to see that kennels provide protection from weather and that the environment is hygienic. All animals are fed approved rations, and are required to have a definite amount of exercise and daily training to keep them in proper condition. Homing pigeons used by the U. S. Army Signal Corps receive similar attention.

*Colonel Robertson is a graduate of San Francisco Veterinary College (1917) and he is a member of the AVMA. His home is at 1253 Virginia Ave., Glendale, Calif.

The Army veterinarian's job is a never-ending variety of tasks and assignments. Regardless of the mission — be it liaison with the British Army or civilian veterinarians, the care and treatment of guard dogs or pigeons, or the inspection of foods—the duty of the veterinary service is to protect and safeguard the health of the troops.

Award of Star to the Meritorious Service Unit Plaque

The Veterinary Food Inspection Detachment of the 1745th Service Command Unit, Fort Omaha, Neb., which was awarded the Meritorious Service Unit Plaque on 18 December 1944 has been awarded a star in lieu of a second plaque, because: (quoting) "In the six months following the first presentation of the Meritorious Service Unit Plaque, the officers and men of this unit have functioned with the same high professional efficiency and enthusiastic attention to duty which was described in the original notice of award." The star was awarded 2 July 1945.

Surgeon General Discusses Record and Program of Army Medical Department

At the Secretary of War's press and radio conference on May 24, 1945, Surgeon General Norman T. Kirk spoke of the problems which the Medical Department had been called upon to surmount in all parts of the world, and the principal disease hazards which will be faced in the second phase of World War II in the Pacific. He said that every fighting unit in that area has the same high type of medical organization and service as those in other theaters.

The main diseases to be encountered in the Pacific, he said, are malaria, the dysenteries, scrub typhus, skin infections, schistosomiasis, filariasis, and dengue fever. Malaria, for example, has already been reduced to one-fourth of its incidence in the early part of the war so that the overall mortality in the Army is only 0.01 per cent. Excellent progress is also being made in keeping other diseases to a low level.

The Surgeon General also stated that the use of D.D.T. and atabrine is primarily responsible for lowering the incidence of the most disabling tropical diseases; that in addition to protecting the health of soldiers, the Army medical department is affording all possible protection against disease and harmful pests which might be brought into the United States by military traffic. For example, passengers, planes, ships, and cargoes are sprayed with insecticides in order to eliminate insects. Control measures against rats and other vermin are

employed. It has been found that ships can be built so that rats cannot live or breed aboard them, and modern American ships are therefore practically free of this age-old problem.

General Kirk said that performing the essential functions of the Army medical department has required the services of 45,000 medical off-

cers, 15,000 dentists, 2,000 veterinary officers, 52,000 nurses, 18,700 administrative corps men, 2,500 sanitary corps specialists, 1,000 physical therapists, 1,500 dietitians, 61 pharmacy corps officers, 535,000 enlisted medical aid men, and about 80,000 civilian employees.

Veterinary Corps at Work in Paris



—From Bulletin of the U. S. Army Medical Department

Veterinary Corps personnel are shown in the picture (above) inspecting frozen poultry and lamb at a cold storage plant in Paris, to insure that the products are safe for issue to troops. This service in Paris is commanded by Col. Clell B. Perkins, V.C., U.S.A., who writes, under date of May 5, of having enjoyed dinner with "our mutual friend, Dr. Pierre Blaizot," and the chief veterinarian of the French Army. The Colonel adds that since the war is about finished "I want to retire and, like Cincinnatus, take the handles of my plow." Perhaps few are aware that besides having served in all grades in the Veterinary Corps of the Regular Army, Colonel Perkins is an Ohio farmer.



Col. Clell B. Perkins

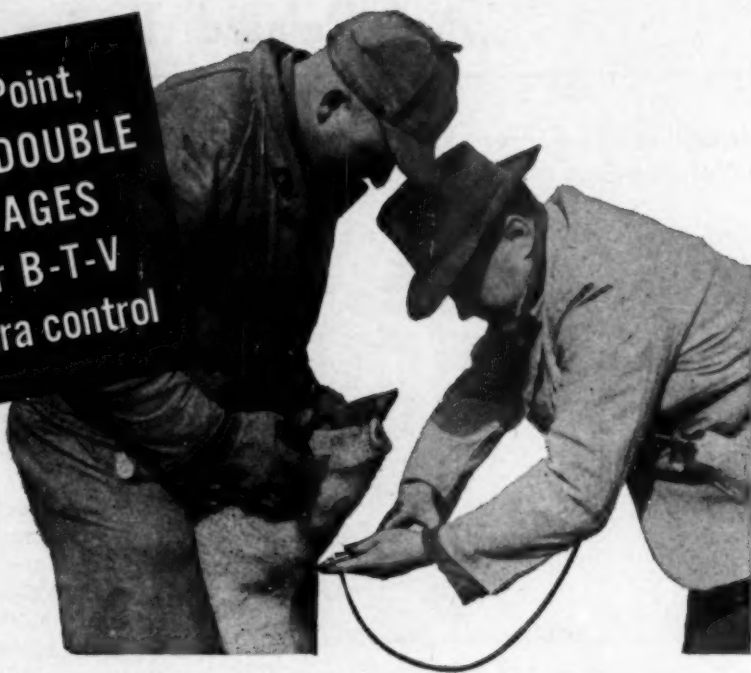
Veterinary Officer Receives Bronze Star Medal

Captain Luther A. Fahlund, formerly of Grand Rapids, Mich., was recently awarded the Bronze Star. The citation accompanying the award read:

"Luther A. Fahlund, 0-515973, Captain, Veterinary Corps, 601st Field Artillery Battalion (Pack), for heroic achievement in action on April 11, 1945, in the vicinity of Bahra, Germany. When his vehicle was taken under fire from a German ambush behind friendly lines, he and his enlisted driver withdrew to covering positions to defend the vehicle with only their small arms, and in the ensuing fire fight with a superior force of Germans trying to capture the vehicle, Captain Fahlund and his driver routed them and inflicted one casualty. By his courage and determination in the face of grave danger he prevented the capture of his vehicle, drove off the enemy before him and denied the enemy the use of tanks demobilized by lack of gasoline. Entered military service from Grand Rapids, Mich."

More Veterinary Officers Needed. — In line with a directive that steps be taken to bring larger numbers of meat producing establishments under federal inspection in order to meet the requirements of the Armed Forces a survey is being made. It is anticipated that 150 additional veterinary officers will be required because the Department of Agriculture cannot supply the inspection at plants which will be brought under federal supervision.

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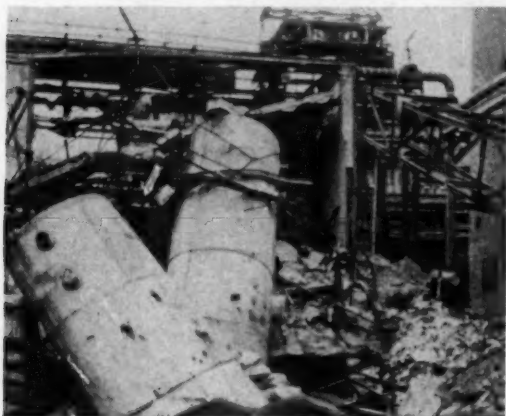
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An' Related Topics

Demolition of a Factory Well Known to Veterinarians



—U. S. Army Bureau of Public Relations Photo

During World War I, when trade with Germany was stopped, some of our supply houses had to resort to Japan for surgical instruments, which were of inferior quality. But, when Hitler was rising to power, agents of the I. G. Farben factory at Ludwigshafen swarmed in, out sold the Japs, and flooded the trade with instruments passable to the not-too-critical, but better than the Japs'. Now, even that's gone. See what the U. S. Army 8th Air Corps "went and did" to the factory. Where do we go from here?

When the name of a proprietary remedy can be written without a big capital letter on the near end, without violating the rules of good grammar, it has won a permanent place in the pharmacology of the realm. Writing argyrol, adrenalin, pituitrin, theelin, nambutal, etc., commits no sin against good usage. The "l.c." is a reward of merit.

The Veteran

Dad, what's a veteran? A veteran, my son, is the fall guy who didn't shirk when war broke out and got a raw deal when peace came along. The veteran's is a case of "Ask and ye shall receive(?); seek and ye shall find(maybe); knock and it shall be opened unto you(likel); or son, should I say "root hog or die."

According to the prattle of the air, the veterans of World War II will be in clover. But, they won't. According to history—that great repeater—promises will stop with the shooting. The fault with this postwar relief business is that the relief societies quit when the work starts. The fathers and mothers and sisters and brothers left over from World War I, and all their sons and daughters of World War II, will be a lot of votes for the politicians to handle. But, they'll handle 'em, see if they don't.

Of de Kruif's "The Male Hormone," reviewed in the June issue, *J.A.M.A.* wise-cracks: "An allegedly scientific exposition which turns out to be terribly funny if you know de Kruif, Bundesen, Klumpp, and Elmer Bobst and think about them and testosterone."

The ambulance gliders, inaugurated in the American theater on the Rhine in March, promises to replace the old way of transporting battle casualties long distances over rough terrain.

IN CANKER
OTORRHEA
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ENCEPHALOMYELITIS SEASON IS HERE

July, August and September are the months when serious outbreaks of equine encephalomyelitis have occurred. The danger of an outbreak is not over until cold weather.

If an extensive outbreak should occur this year, will it catch a large proportion of the horses in your community susceptible because of not having been vaccinated? If so, it will be both a local and a national calamity.

A serious outbreak would place such a demand upon the time of practitioners that it could not be met without neglecting other important work.

There are many sound reasons why preseasonal vaccinations should be done. There are no sound reasons why it should not be done.

To urge farmers to have their horses vaccinated against encephalomyelitis is genuine cooperation in our war effort.

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Dosage Recommendations: For cattle and horses, 25 cc. by subcutaneous or intramuscular injection. This may be repeated in twenty days if indicated. For oral warts in dogs, give from 1 to 5 cc. according to body weight and repeat in five to seven days if indicated.

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